

# KPR-S46MH1/S53MH1

RM-821

## SERVICE MANUAL

Hong Kong Model

KPR-S46MH1

Chassis No. SCC-F63A-A

KPR-S53MH1

Chassis No. SCC-F65A-A



**KIRARA  
BASSO**

**AP-2 CHASSIS**

### SPECIFICATIONS

Structure Screen and projector, rear projection type  
Projection system 3 picture tubes, 3 lenses, horizontal in-line system  
Picture tube 7-inch, High-brightness monochrome tubes (5.5 raster size), with optical coupling and liquid cooling system  
Projection lenses High performance, large-diameter hybrid lens F 1.0  
Screen material Plastic lenticular, Plastic Fresnel  
Television standard B/G, SECAM, NTSC, etc., NTSC  
NICAM stereo system I system  
Antenna 75-ohm external antenna terminal  
Speakers Woofer 13 cm  
Tweeter 2.5 cm

Model	KPR-S46MH1	KPR-S53MH1
Resolution	859 lines	900 lines
Projected picture size (measured diagonally)	46 inches	53 inches
Screen brightness	1,644 cd/m <sup>2</sup>	1,233 cd/m <sup>2</sup>
Dimensions (w/h/d)	1103.9 x 1289.1 x 506.8 mm	1237.9 x 1301.9 x 609.6 mm
Mass	73 kg	85 kg

Power requirements 120/240 V AC, 50/60 Hz  
Power consumption 335 W  
Accessories supplied RM-821 Remote Commander (1)  
R6 batteries (2)  
Power cord plug adaptor (2)  
Optional accessories RM-829 Remote Commander

#### Inputs

Jack	S VIDEO	VIDEO	AUDIO L/R
VIDEO 1	4-pin mini DIN Y: 1 Vp-p, 75 ohms, unbalanced, sync negative C: 0.286 Vp-p, 75 ohms	Phono jack 1 Vp-p, 75 ohms, unbalanced, sync negative	0.5 Vrms (standard level, 47 kilohms)
VIDEO 2			
VIDEO 3			
VIDEO 4	4-pin mini DIN Y: 1 Vp-p, 75 ohms, unbalanced, sync negative C: 0.286 Vp-p, 75 ohms		

### MODELS OF THE SAME SERIES

KPR-S46MH1/S53MH1	

#### Output

Jack	S VIDEO	VIDEO	AUDIO L/R
VIDEO 1	4-pin mini DIN Y: 1 Vp-p, 75 ohms, unbalanced, sync negative C: 0.286 Vp-p, 75 ohms	1 Vp-p, 75 ohms, unbalanced, sync negative	0.5 Vrms (standard level, 5 kilohms or less)
VIDEO 2			
VIDEO 4			
MONITOR			
AUDIO OUT	—	—	

Design and specifications are subject to change without notice.



**PROJECTION TV**  
**SONY®**

### Channel Coverage

#### MIDDLE EAST/ASIA (B/G, H)

Receiveable Channel	Channel Display
E-2 to E-12	C02 to C12
E-21 to E-69	C21 to C69
<b>Indonesia</b>	
2 to 11	C03 to C12
<b>Morocco</b>	
M-4 to M-7	C70 to C73
M-8 to M-10	C8 to C10
<b>New Zealand</b>	
2	C03
3	C04
4 to 9	C05 to C10

#### CATV W. EUROPE (B/G, H)

Receiveable Channel	Channel Display
S-01 to S-03	C42 to C44
S-1 to S-41	C01 to C41

#### AUSTRALIA (B/G, H)

Receiveable Channel	Channel Display
<b>Australia</b>	
AS-0 to AS-11	C00 to C11
AS-5A	C12
AS-28 to AS-69	C28 to C69
<b>New Zealand</b>	
2 to 3	C01 to C02
4 to 7	C06 to C09
8	C13
9	C10

#### HK/UK (I)

Receiveable Channel	Channel Display
<b>Hong Kong, United Kingdom</b>	
B-21 to B-68	C21 to C68
<b>Ireland</b>	
B,C,...., J	C02, C03,...., C09
<b>South Africa</b>	
4 to 13	C04 to C13
21 to 68	C21 to C68

#### E.EUROPE/CHINA (D/K)

Receiveable Channel	Channel Display
<b>East European countries</b>	
R-1 to R-12	C01 to C12
R-21 to R-60	C21 to C60
<b>China</b>	
C-1	C01
C-2	C02
C-3	C13
C-4	C03
C-5	C04
C-6	C14
C-7 to C-12	C06 to C11
C-13 to C-24	C21 to C32
C-25 to C-47	C38 to C60
C-48 to C-57	C61 to C70

#### AMERICA (M)

Receiveable Channel	Channel Display
2 to 83	C02 to C83

#### CATV AMERICA (M)

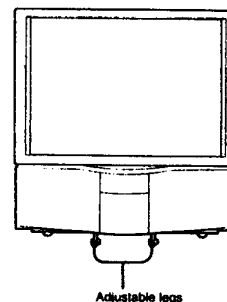
Receiveable Channel	Channel Display
2 to 13	C02 to C13
A-1	C99
A-2	C98
A-3	C97
A-4	C96
A-5	C95
A-6	C06
A-7	C05
A-8	C01
A, B,...., W	C14, C15,...., C36
AA,...., CCC	C37,...., C85

#### JAPAN

Receiveable Channel	Channel Display
J-1 to J-62	C01 to C62
C-13 to C-32	C80 to C99

## Stabilizing the Projection TV

The TV should be installed so that it is as level as possible, for safety purposes. After setting up, always lower the two adjustable legs located at the bottom, by turning the legs to the left, to stabilize the TV.



### CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK **A** ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.



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The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.

This section briefly describes the buttons and controls on the TV set and on the Remote Commander. For more information, refer to the pages given next to each description.



- 6

- 7

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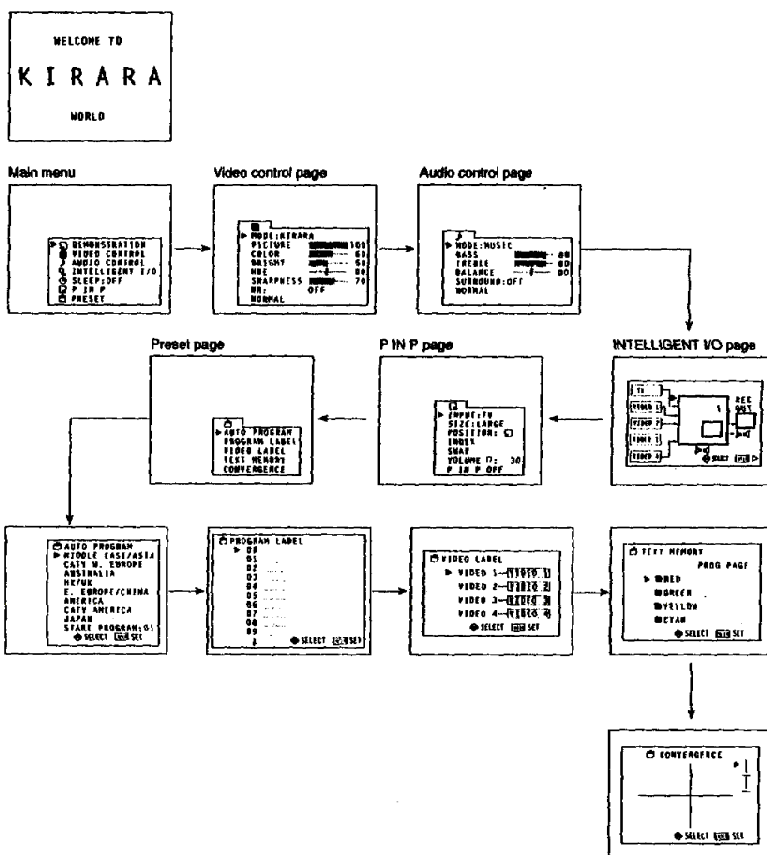
- 8



## Introduction of Menu

You will perform presetting, adjustment and other setting on the menu. Before beginning the presetting and operation, we suggest to have a look at the pages in the menu.

Press the DEMO button on the Remote Commander.  
All the menu pages appear in sequence, and repeatedly.  
To stop demonstration, press any button.



## Presetting the Channels

### Channel Allocation

#### Areas allocated in "MIDDLE EAST/ASIA" channel system

Afghanistan, Albania, Algeria, Austria, Bahrain, Bangladesh, Belgium, Brunei, Canary Islands, Cyprus, Denmark, Egypt, Finland, Germany, Ghana, Gibraltar, Greece, Iceland, India, Indonesia, Iran, Iraq, Italy, Jordan, Kenya, Republic of Korea, Kuwait, Lebanon, Liberia, Libya, Luxemburg, Malaysia, Malta, Mauritania, Mauritius, Maldives Rep., Morocco, Mozambique, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Portugal, Qatar, Sarawak, Saudi Arabia, Seychelles, Sierra Leone, Singapore, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Switzerland, Syrian Arab Rep., Tanzania, Thailand, Tunisia, Turkey, Uganda

#### Areas allocated in "CATV W. EUROPE" channel system

United Arab Emirates, Western Sahara, Yemen Arab Republic, People's Dem. Rep. of Yemen, Yugoslavia, Zambia, Zimbabwe

#### Areas allocated in "AUSTRALIA" channel system

Australia, New Zealand

#### Areas allocated in "HK/UK" channel system

Hong Kong, Ireland, Lesotho, South Africa, United Kingdom

#### Areas allocated in "E. EUROPE/CHINA" channel system

Bahia, Bulgaria, China, Congo, Czechoslovakia, Djibouti Republic, Gabon, Guadeloupe, Guinea, Guinea (P.P.R.), Hungary, Ivory Coast, Dem. People's Rep. of Korea, Madagascar, Mongolia, New Caledonia, Niger, Poland, Reunion, Rumania, Senegal, Tahiti, Togo, Former U.S.S.R., Vietnam, Zaire

#### Areas allocated in "AMERICA" channel system

Bahama Islands, Barbados, Belize, Bermuda, Bolivia, Burma(UHF), Canada, Chile, Colombia, Costa Rica, Cuba, Dominica Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Hawaii, Honduras, Jamaica, Laos, Mexico, Panama, Peru, Philippines, Puerto Rico, Surinam, Taiwan, Trinidad & Tobago, U.S.A., Venezuela

#### Areas allocated in "CATV AMERICA" channel system

U.S.A.(CATV)

#### Areas allocated in "JAPAN" channel system

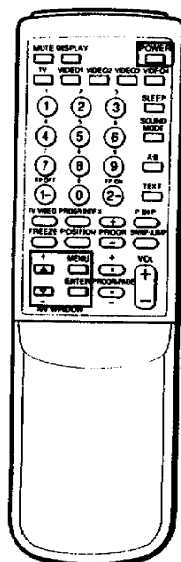
Japan (UHF, VHF), Burma (Myanmar) (VHF)

### TV and Color System of the Channel System

The TV system and color system are automatically set according to the channel system.

Channel system	TV system	Color system
MIDDLE EAST/ASIA	B/G, H; West European TV standard	AUTO
CATV W.EUROPE	B/G, H; West European TV standard	AUTO
AUSTRALIA	B/G, H; Australian TV standard	AUTO
HK/UK	I; British TV standard	AUTO
E. EUROPE/CHINA	D/K; East European TV standard	AUTO
AMERICA	M; American TV standard	AUTO
CATV AMERICA	M; American TV standard	AUTO
JAPAN	M; Japan TV standard	AUTO

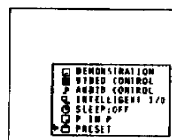
## Presetting the Channels



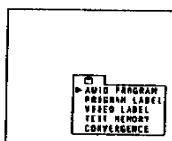
### Preset Channels Automatically

Up to 30 receivable channels from the lowest channel are automatically preset in the consecutive program positions (1 to 29, 0). With this method, you can preset all receivable channels at once.

- 1 Press the POWER switch of the TV to turn on the TV.
- 2 Press MENU on the Remote Commander.
- 3 Move the red cursor to "PRESET" using  $\Delta$  or  $\nabla$ , then press ENTER.



- 4 Move the red cursor to "AUTO PROGRAM" using  $\Delta$  or  $\nabla$ , then press ENTER.



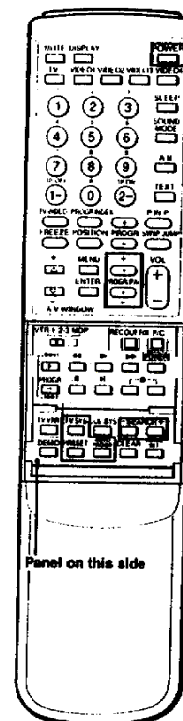
- 5 Move the red cursor to your channel system using  $\Delta$  or  $\nabla$ , according to the list on page 13, then press ENTER. Presetting starts from program position 1. When presetting is finished, 1 (program number) appears.

Program and channel numbers

P01 C01 → P01 C02 → P02 C03 → 1

If you want to start a program number other than 1  
Before pressing ENTER in step 5, press PROGR +/- or the number button until the number you want appears at "START PROGRAM: \_\_\_".

If you cannot use the Remote Commander  
Use the MENU, ENTER, + and - buttons on the TV, and perform as above.



To preset the channels automatically without using the menu

- 1 Press the POWER switch of the TV to turn on the TV.
- 2 Press PRESET on the Remote Commander.
- 3 Select your channel system by pressing TV SYS, referring to "Channel Allocation" on page 13.  
MIDDLE EAST/ASIA → CATV W. EUROPE → AUSTRALIA → HK/HK  
JAPAN → CATV AMERICA → AMERICA → E. EUROPE/CHINA
- 4 Press AUTO PROGR.

P01 C01 → P01 C02 → P02 C03 → 1

### Preset Channels Manually

Use this method if there are only a few channels in your area to preset or if you want to preset channels one by one.

- 1 Press the POWER switch of the TV to turn on the TV.
- 2 Press PRESET on the Remote Commander.
- 3 Using the PROGR/PAGE + and - buttons, select the program position to which you want to preset a channel.
- 4 Select your channel system by pressing TV SYS.

MIDDLE EAST/ASIA → CATV W. EUROPE → AUSTRALIA → HK/HK  
JAPAN → CATV AMERICA → AMERICA → E. EUROPE/CHINA

- 5 Tune in the channel, using the SEARCH +/- buttons. The channel number starts counting up or downwards. When a channel is found, it stops.





- 6 Repeat steps 3 to 5 to preset other channels.

- 7 Press PRESET.

## Additional Presetting Functions

### Skipping Program Positions

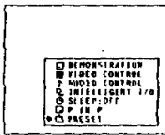

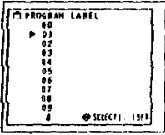
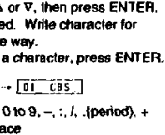
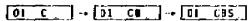
You can skip unused program positions when selecting programs with the **PROGR/PAGE** + and - buttons. However, the skipped programs may still be called up when you use the number buttons.

- 1 Press **PRESET**. 
- 2 Select the program position using **PROGR/PAGE** + and - buttons. 
- 3 Press **CLEAR**. 
- 4 Press **PRESET**. 

Repeat steps 1 to 4 to skip other program positions.

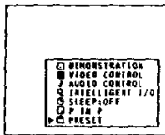
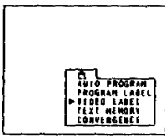
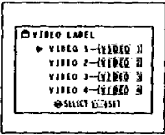
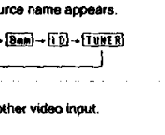
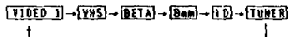
### Captioning a Station Name

You can "name" a channel using up to four characters so that the name is displayed under the program number. Using this function, you can easily identify which channel you are watching.

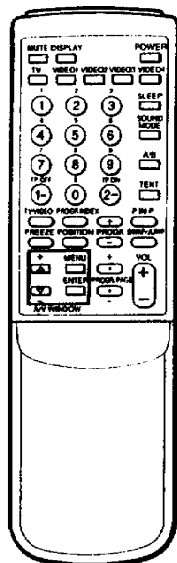
- 1 Press **MENU**. 
- 2 Move the red cursor to "PRESET" using  $\Delta$  or  $\nabla$ , then press **ENTER**. 
- 3 Move the red cursor to "PROGRAM LABEL" using  $\Delta$  or  $\nabla$ , then press **ENTER**. 
- 4 Move the red cursor to the program number you want using  $\Delta$  or  $\nabla$ , then press **ENTER**. The first underline of the selected program number turns red. 
- 5 Select a character using  $\Delta$  or  $\nabla$ , then press **ENTER**. The next underline turns red. Write character for each underline in the same way. If you do not want to write a character, press **ENTER**.   
Usable characters: A to Z, 0 to 9, -, ., /, (period), + and space
- 6 Repeat steps 4 and 5 to caption other program numbers.
- 7 When you finished, press **MENU**.

### Captioning a Video Input

Using this function, you can identify the source (VHS, Beta, 8mm, Multi disc player, Tuner) of the video inputs, as the source is displayed under the video input.

- 1 Press **MENU**. 
- 2 Move the red cursor to "PRESET" using  $\Delta$  or  $\nabla$ , then press **ENTER**. 
- 3 Move the red cursor to "VIDEO LABEL" using  $\Delta$  or  $\nabla$ , then press **ENTER**. 
- 4 Move the red cursor to the video input (1, 2, 3, 4) you want using  $\Delta$  or  $\nabla$ . 
- 5 Press **ENTER** until the source name appears. 
- 6 Repeat steps 4 and 5 for other video input.
- 7 When you finished, press **MENU**.

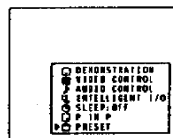
## Adjusting Color Registration (CONVERGENCE)



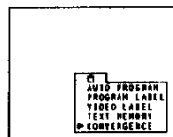
In a TV, the projection tube image appears on the screen in three color layers (red, green and blue). If these layers are not in proper registration, the color is poor and the picture blurs. To correct this, perform the CONVERGENCE adjustment.

**1** Press MENU.

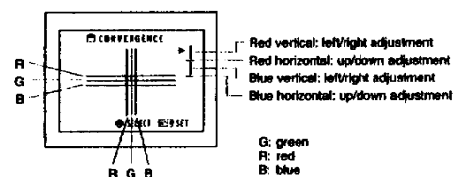
**2** Move the red cursor to "PRESET" using  $\Delta$  or  $\nabla$ , then press ENTER.



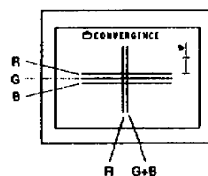
**3** Move the red cursor to "CONVERGENCE" using  $\Delta$  or  $\nabla$ , then press ENTER.



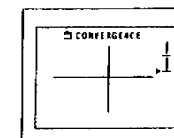
**4** Move the red cursor to the symbol representing the line you want using  $\Delta$  or  $\nabla$ , then press ENTER.



**5** Press  $\Delta$  or  $\nabla$  until the line converges with the center green line, then press ENTER. To move the line up or to the right, use  $\Delta$ . To move the line down or to the left, use  $\nabla$ .

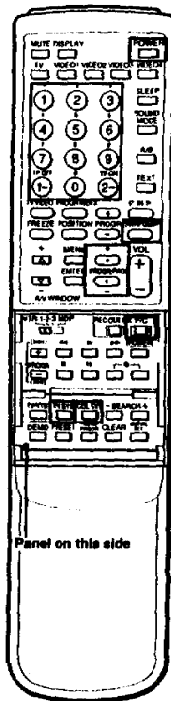


**6** Repeat steps 4 and 5 to adjust the other lines, until all the lines have overlapped to form a white cross.



**7** When you finished, press MENU.

## Watching the TV



This section explains the basic functions you use while watching the TV.

### Switching the TV on and off

#### Switching on

Press the POWER switch of the TV.

#### Switching off temporarily

Press POWER on the Remote Commander.

The TV enters standby mode and the standby indicator on the front of the TV lights up.

#### Switching on again

Press POWER, TV, PROGRAM/PAGE +/-, or one of the number buttons on the Remote Commander.

If you cannot use the Remote Commander, press PROGRAM +/- on the TV.

#### Switching off completely

Press the POWER switch of the TV.

### Selecting TV Programs

Press PROGRAM/PAGE +/- or press number buttons.

To select program 5, press "5".

To select program 10, press "1"-"0".

To select program 25, press "2"-"5".

#### To return to the previous program number

Press JUMP. (This button functions as SWAP when the P IN P (see page 25) is displayed.)

#### If the sound is noisy or not heard

Press TV SYS until the sound becomes clear.

#### If the color program does not appear in color

Press COL SYS until the color becomes normal.

### Selecting TV Program by Channel Number (not by program number)

See page 33 for the channel numbers.

1 Press P/C so that C- appears.

2 While C- is on, select the channel system by pressing TV SYS.

The TV becomes channel tuning mode.

3 While C- is on, press the channel number.

To select channel 5, press "0", "5".

To select channel 25, press "2", "5".

#### To skip channels

1 Press P/C so that C- appears.

2 Select the channel number to be skipped using the number buttons or PROGRAM/PAGE +/- buttons.

3 Press CLEAR.

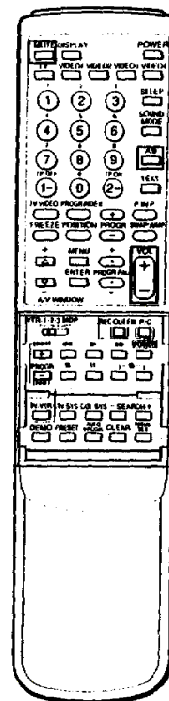
Repeat steps 1 to 3 to skip other channels.

To restore the skipped channel, tune in the channel and press PRESET.

#### To select TV programs by program number

1 Press P/C so that P- appears.

2 While P- is on, press the program number.



### Adjusting the Volume

Press VOL +/-.



### Muting the Sound

Press MUTE.

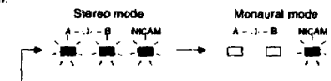
MUTE

To resume normal sound, press MUTE again.

### Receiving a Stereo or Bilingual Program

#### When the TV receives a NICAM stereo system program

The NICAM lamp, A and B mode lamps light. Press A/B to select stereo or monaural mode. If the signal is very weak, the sound becomes monaural. The NICAM, A and B mode lamps go off.



#### When the TV receives a NICAM bilingual system program

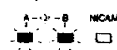
The NICAM lamp, A and/or B mode lamp(s) light. Press A/B so that the lamp (A or B) of the mode you want lights up.



#### When the TV receives a German stereo system program

The A and B mode lamps light.

If the signal is very weak, the sound becomes monaural. The lamps go off.



#### When the TV receives a German bilingual system program

A and/or B mode lamp(s) light(s). Press A/B so that the lamp (A, B, or A and B) of the mode you want lights up.



#### Who can receive the NICAM stereo/bilingual system

The NICAM stereo/bilingual system is receivable in Hong Kong, Singapore, New Zealand, etc.

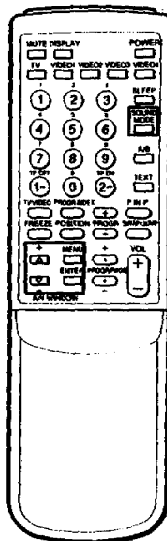
#### Who can receive the German stereo/bilingual system

The German stereo/bilingual system is receivable in Australia, Malaysia, Thailand, etc.





## Watching the TV



### Effect of each control

#### Picture

Item	Press	Effect
MODE	ENTER	→ KIRARA → MIDDLE → SOFT
PICTURE	Δ/V → ENTER	Less [     ] More
COLOR	Δ/V → ENTER	Less [     ] More
BRIGHT	Δ/V → ENTER	Darker [     ] Brighter
HUE	Δ/V → ENTER	Greenish [     ] Reddish (for NTSC signal only)
NR <sup>1)</sup>	ENTER	→ OFF → ON
NORMAL	ENTER	"NORMAL" becomes red in a moment and the settings are reset to the factory preset levels.

1) Noise reduction. Set to ON when the picture is noisy because of a weak signal or tape deterioration.

#### Sound

Item	Press	Effect
MODE	ENTER	→ MUSIC → STANDARD → NEWS
BASS	Δ/V → ENTER	Less [     ] More
TREBLE	Δ/V → ENTER	Less [     ] More
BALANCE	Δ/V → ENTER	Left speaker [     ] Right speaker
SURROUND	ENTER	→ OFF → MUSIC <sup>2)</sup> → MOVIE <sup>3)</sup> → SPACE <sup>4)</sup>
NORMAL	ENTER	"NORMAL" becomes red in a moment and the settings are reset to the factory preset levels.

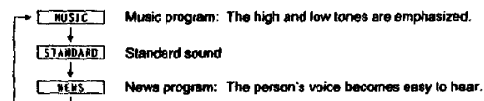
- 2) MUSIC mode is effective for music programs.  
 3) MOVIE mode is effective for movie programs.  
 4) SPACE mode gives spacious monaural sound.

### Menu

When the menu is displayed, you cannot change the program using the number buttons. Use **PROGR/PAGE** +/-.

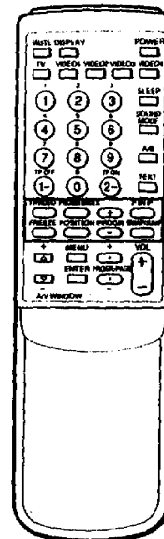
### Selecting the Sound Mode

You can select a proper sound mode in accordance with the program. Select the sound mode by pressing **SOUND MODE**.



## Picture In Picture (P IN P)

### Buttons for P IN P operation



With this function you can display a "P IN P screen" (small picture) within the main picture of TV program or video input. In this way you can watch or monitor TV program or the video input from any connected equipment while watching TV or other video input. For information about connection of other equipment, see page 29.

### Switching P IN P on and off

Press **P IN P**.

The P IN P screen is displayed. The P IN P picture comes from the source chosen when the TV was last used.

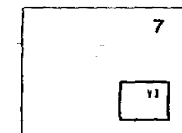
To switch P IN P off  
 Press **P IN P** again.

### Selecting a P IN P source

To select a TV program, use **PROGR** + and - buttons of the P IN P section.  
 To select a video input, press **TV/VIDEO**.

Each time you press **TV/VIDEO**, the indication at the top right corner of the P IN P screen changes.

→ TV program number → V1 → V2 → V3 → V4



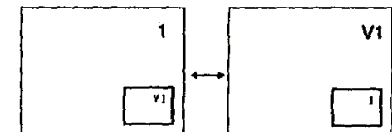
### Notes

- If no video source has been connected, the P IN P screen is black.
- You may not be able to receive some channels in P IN P, even though they are being received for the main picture.
- If you display the signals for different color systems (PAL, SECAM, NTSC) for the main picture and in the P IN P, size of the P IN P may be different.
- If a TV channel in which no program is broadcast is received for the P IN P screen, the program number of P IN P may become black.

### Swapping screens

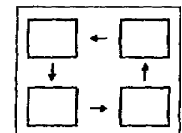
Press **SWAP**.

The main screen switches the picture with the P IN P screen.

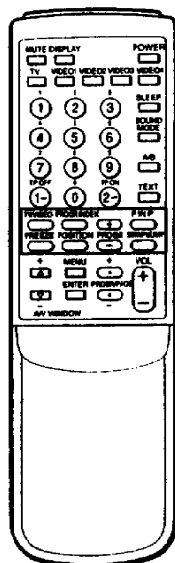


### Changing the position of the P IN P

Press **POSITION** repeatedly to change the position of the P IN P screen. There are four different positions available.



## Picture In Picture (P IN P)



### Freezing the P IN P picture

Press FREEZE.  
To restore the normal picture, press FREEZE again.

### Note

If you press FREEZE when there is no P IN P screen, the main picture is frozen and appears in the P IN P screen.

### Checking the programs available

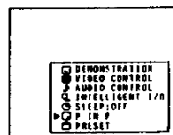
Press PROGR INDEX. The preset programs appear in the P IN P screen one by one in sequence.  
To stop checking programs, press PROGR INDEX.

### Operating P IN P using the menu or on the TV

Use the MENU, ENTER, Δ and ∇ buttons on the Remote Commander or on the TV.

Using the menu, you can change the P IN P size and adjust the P IN P headphones volume to hear through the headphones besides the above operations (except freezing).

- 1 Press MENU.
- 2 Move the red cursor to "P IN P" using Δ or ∇, then press ENTER.



- 3 Move the red cursor to the item you want to set using Δ or ∇, then press ENTER.

INPUT: TV → VIDEO 1 → VIDEO 2 → VIDEO 3 → VIDEO 4

SIZE: SMALL → LARGE

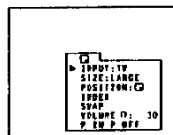
POSITION: [ ] → [ ] → [ ] → [ ]

INDEX: Performed on the P IN P screen.

SWAP: Performed on the TV.

VOLUME: Adjust using Δ or ∇, then press ENTER.

P IN P OFF: The P IN P screen disappears.

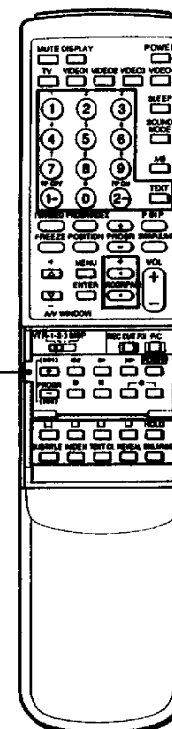


### Notes

- When you display a VTR picture at speeds other than normal speed, such as fast-forward playback, on the P IN P screen, the picture may be noisy depending on the VTR. The picture may be improved by selecting the "SMALL" size of the P IN P screen.
- You cannot hear the sound of the NICAM and German stereobilingual system program in the P IN P picture.
- While fast-forwarding or reversing the picture of a PAL system signal on an 8 mm VTR, the picture may be distorted.

## Teletext

### Buttons for teletext operation



TV stations broadcast an information service called Teletext via a TV channels. Teletext service allows you to receive various information pages such as weather reports or news at any time you want.

### Switching Teletext on and off

- 1 Select the TV channels which carries the teletext broadcast you want to watch.
- 2 Press TEXT to switch on the teletext.  
A teletext page will be displayed (usually the index page). If there is no teletext broadcast, P100 is displayed at the top left corner of the screen.

### To switch Teletext off

Press TV.

### Superimposing a Teletext page on the TV picture (MIX mode)

Press TEXT.

Each time you press TEXT, the screen changes:

→ Teletext → Teletext and TV → TV

### Checking the contents of the Teletext

Press INDEX to have the overview of the contents of the teletext and page numbers.

### Selecting a Teletext page

Use the number buttons to input the three digits of the page number you want to turn on.

If you have made a mistake, type in any three digits. Then re-enter the correct page number.

To access the next or preceding page, press PAGE + or PAGE -.

### Holding a Teletext page

A teletext page may consist of several subpages. You can stop the page scrolling in order to read the text at your own pace.

Press HOLD.

The HOLD symbol "H" is displayed at the top left of the screen.

To resume normal teletext operation, press TEXT.

### Enlarging the Teletext display

Press ENLARGE once to enlarge the upper half, twice to enlarge the lower half, and again to resume normal size.

### Revealing concealed information

Sometimes pages contain concealed information, such as an answer to a quiz. The reveal option lets you disclose the information.

Press REVEAL.

To conceal the information, press REVEAL again.

### Displaying subtitles

Press SUBTITLE.

To make the subtitle disappear, press SUBTITLE again.

## Teletext

### Waiting for Teletext page while watching the TV program

After requesting a page, press TEXT CLEAR.

When the page is available, the page number is displayed at the top left corner of the screen.

Press TEXT to switch the teletext on.

### Displaying Teletext page at predetermined time

1 Request a time coded page (e.g. alarm page).

2 Press TP ON.

"Txxx-" appears at the bottom of the screen.

3 Enter your request time of four digits using the number buttons. For example, if you enter 0730, the indication will become "T0730".

4 To watch the TV program, press TEXT CLEAR.

5 At the requested time, the page number is displayed at the top left corner of the screen.

To view the page, press TEXT.

To cancel the page, press TP OFF.

### Using Fastext

With Fastext you can access pages with one key stroke.

When a Fastext page is broadcast, a color-coded menu will appear at the bottom of the screen. The colors of this menu correspond to the RED, GREEN, YELLOW and CYAN buttons on the Remote Commander.

Press the color button which corresponds to the color-coded menu. The page will be displayed after some seconds.

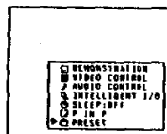
### Switching to a Teletext page you want directly while watching a TV

Using the menu, you can set teletext pages you want so that you can switch to the pages directly while watching a TV by pressing a color button.

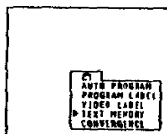
### To set the page

1 Press MENU.

2 Move the red cursor to "PRESET" using Δ or ∇, then press ENTER.

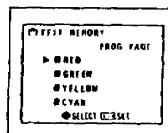


3 Move the red cursor to "TEXT MEMORY" using Δ or ∇, then press ENTER.



4 Move the red cursor to a color you want using Δ or ∇, then press ENTER.

The colors correspond to the color of the buttons.



5 Press the program number button and press ENTER.

For the program number 5, press "5".

For the program number 25, press "2-" and "5".

6 Press the page number button of three digits and press ENTER.

If you made a mistake, enter any three digits and then enter the correct three digits.

If you want to cancel the operation, press "9" for the first digit.

7 Repeat steps 4 to 6 for other pages.

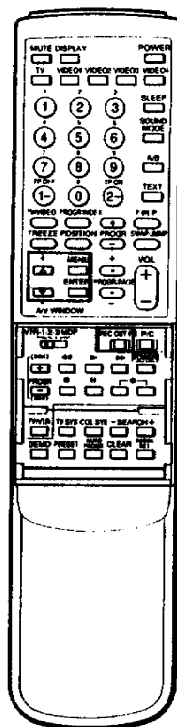
8 Press MENU to return to the TV display.

To view the page, press the color button of the page while watching the TV.



The color buttons function as the FAST TEXT buttons in Teletext mode.

## Selecting Input and Output

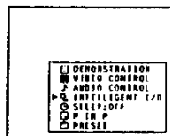


Using the INTELLIGENT I/O function, you can:

- record a source while watching the source.
- record a source while watching another source.
- record picture and sound from different sources.
- record a source while the TV is in standby mode.

### Setting the INTELLIGENT I/O

- 1 Press MENU.
- 2 Move the red cursor to "INTELLIGENT I/O" using  $\Delta$  or  $\nabla$ , then press ENTER.

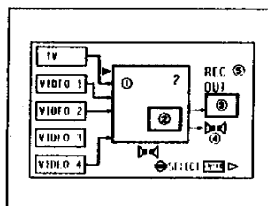


- 3 Select the item using  $\Delta$  or  $\nabla$ , then press ENTER.  
The color of the box or speaker mark becomes the color of the source selected.

- ① Select the source to watch on the TV.
- ② Select the source to be displayed on the P IN P screen.
- ③ Select the video to be recorded.
- ④ Select the sound to be recorded.
- ⑤ Make REC OUT in red or in white.

Red: The REC OUT FIX is on. The REC OUT FIX lamp lights. The recording source is fixed, therefore, even if you change the source to watch, the recording source does not change.

White: The REC OUT FIX is off. The REC OUT FIX lamp is off. The recording source changes accordingly when you change the source to watch.



- 4 Press MENU to go back to the normal TV picture.

To change the program or video input after recording has started, or to turn off the TV (standby)

- If you did not make "REC OUT" in red on the INTELLIGENT I/O page (the REC OUT FIX lamp is not lit), press REC OUT FIX on the Remote Commander.
- If you made "REC OUT" in red (the REC OUT FIX lamp is lit), you do not need any operation.

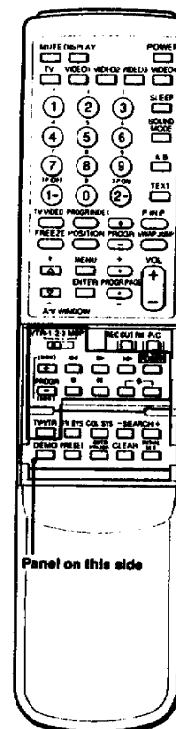
When you set the INTELLIGENT I/O the next time  
Make the "REC OUT" in white, if it is red.

### Notes

- After you started recording, do not turn off the TV by pressing the POWER switch of the TV. The recording stops.
- If you call the INTELLIGENT I/O page while watching the TV, the P IN P is displayed. To turn P IN P off, press P IN P.
- If you change TV program while recording a TV program, the newly selected TV program is recorded, even if you set the REC OUT FIX to on.

## Remote Control of Other Sony Equipment

### Buttons for VTR operation



You can use the TV Remote Commander to control other remote-controlled video equipment such as Beta, 8mm, VHS VTRs or multi disc players.

### Tuning the Remote Commander to the equipment

- 1 Set the VTR 1-2-3-MDP selector according to the equipment you want to control.  
VTR 1: Beta or ED Beta VTR  
VTR 2: 8mm VTR  
VTR 3: VHS VTR  
MDP: Multi disc player

- 2 Use the buttons indicated in the illustration to operate the additional equipment.

If your video equipment is furnished with a COMMAND MODE selector, set this selector to the same position as the VTR 1-2-3-MDP selector on the TV Remote Commander.

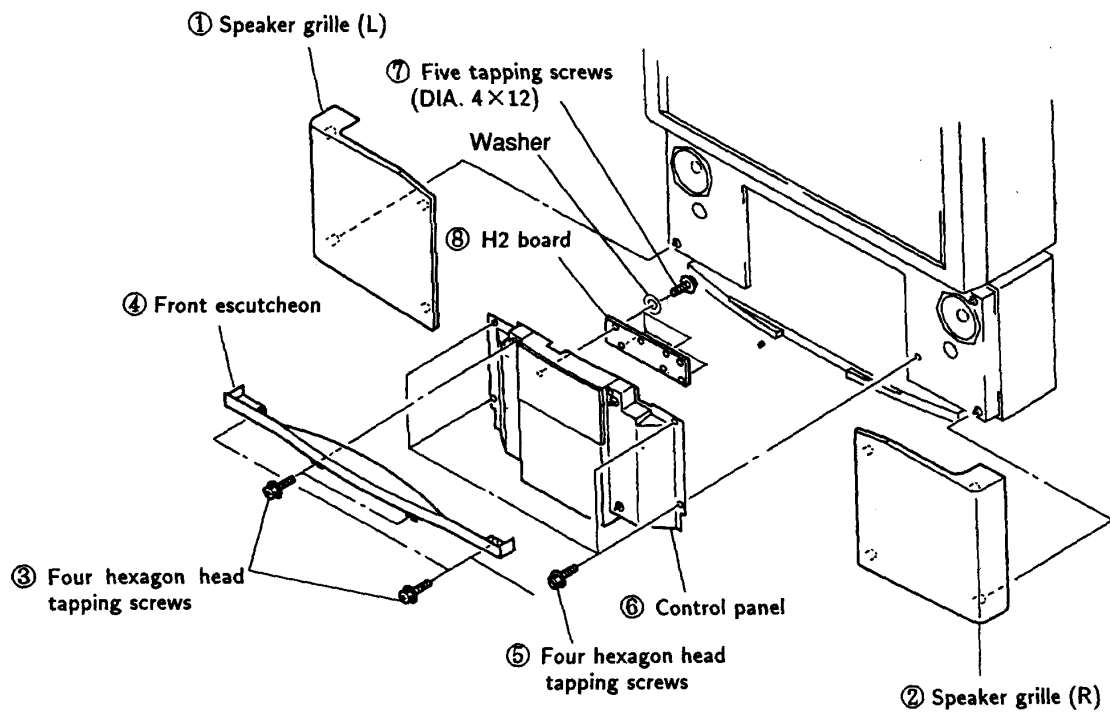
If the equipment does not have a certain function, the corresponding button on the Remote Commander will not operate.

### When recording

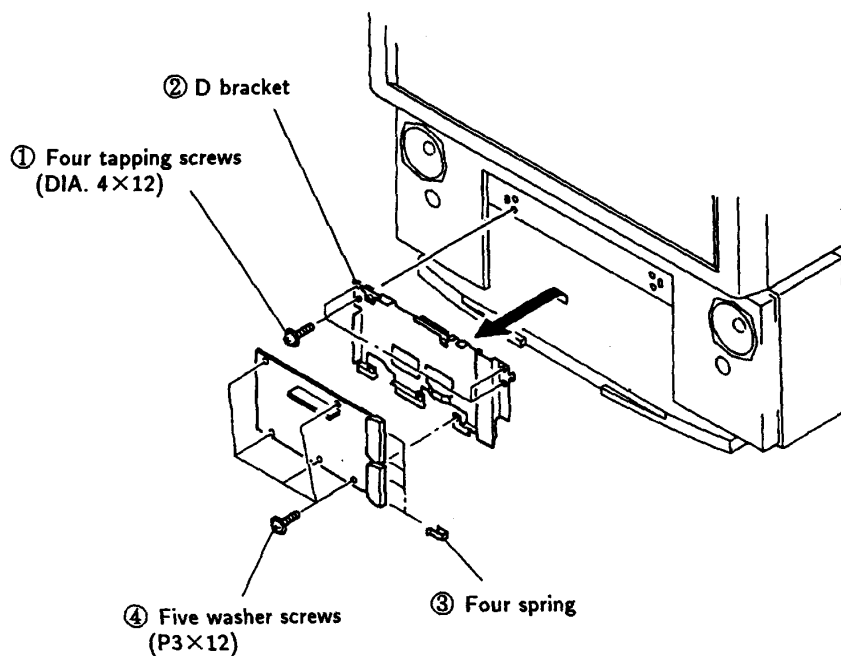
When you use the  $\text{RECORD}$  button, make sure to press these two buttons simultaneously.

## SECTION 2 DISASSEMBLY

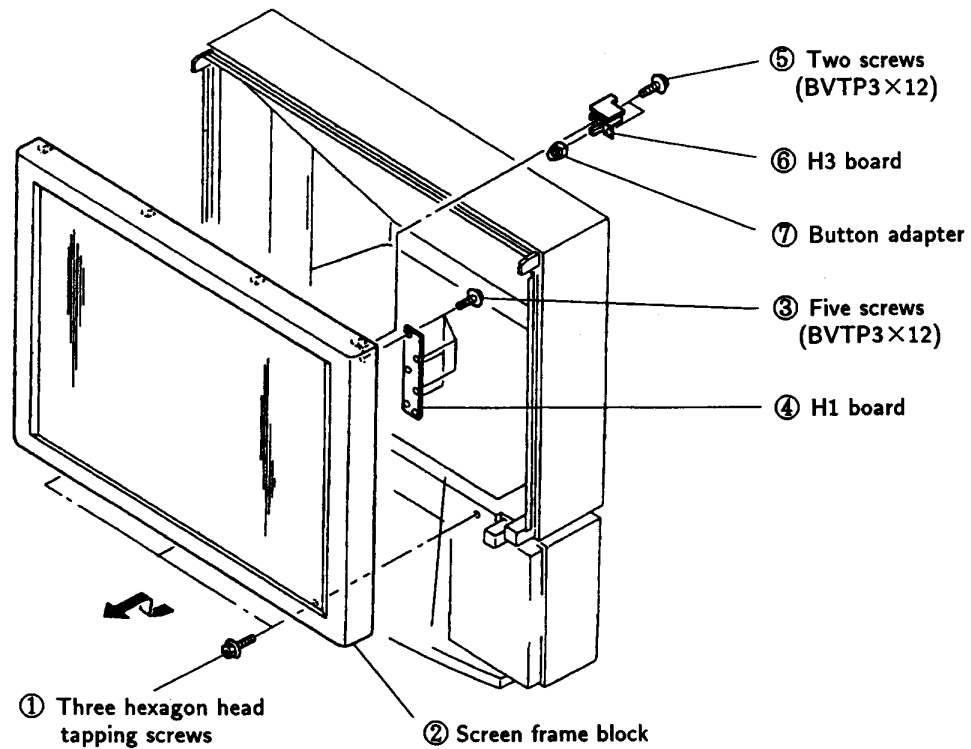
### 2-1. H2 BOARD REMOVAL



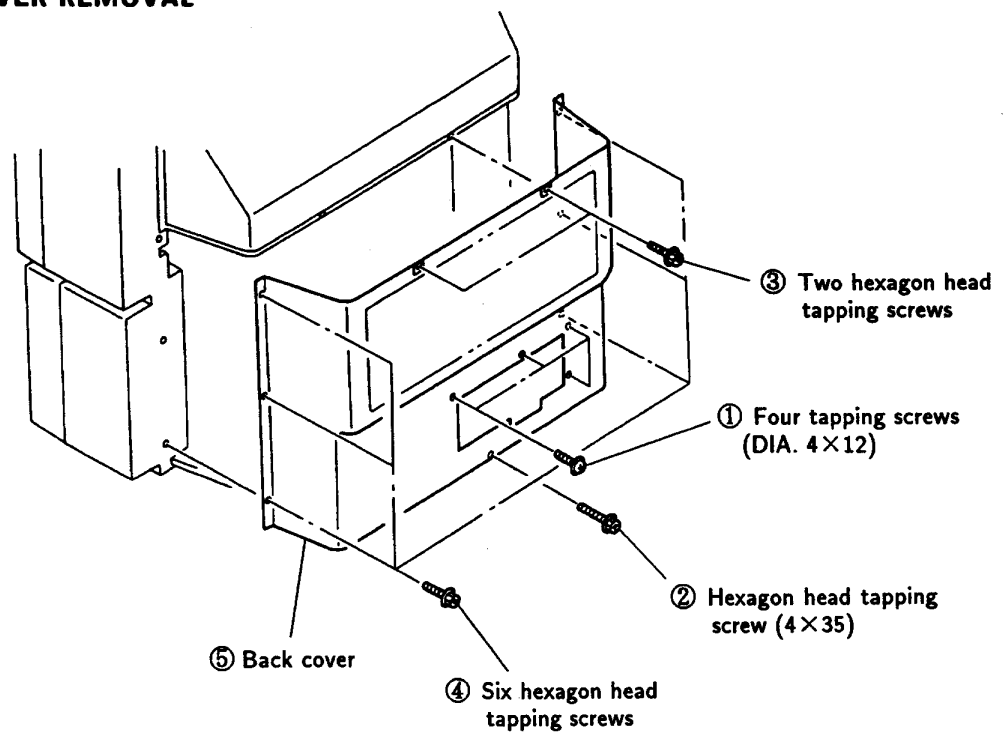
### 2-2. D BOARD REMOVAL



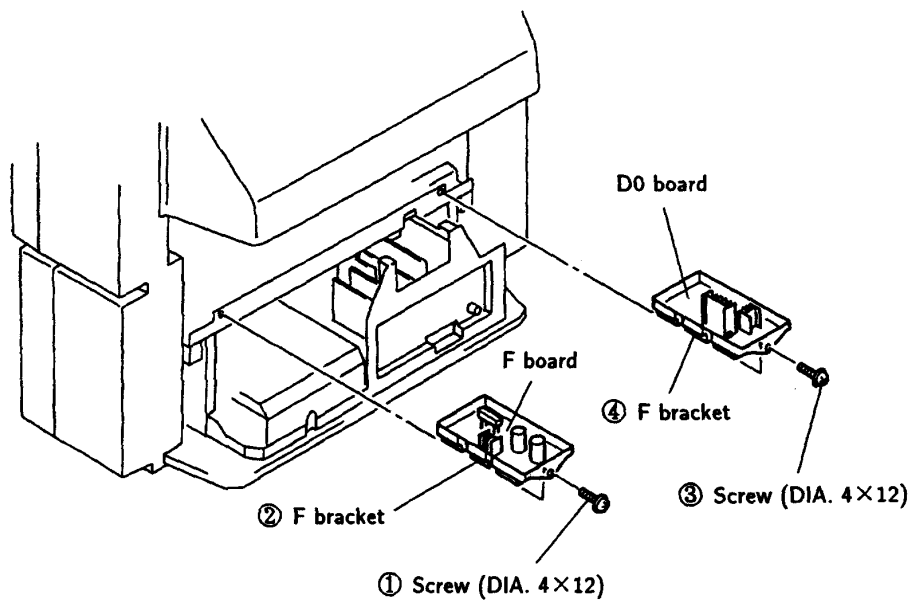
### 2-3. H1 AND H3 BOARDS REMOVAL



### 2-4. BACK COVER REMOVAL



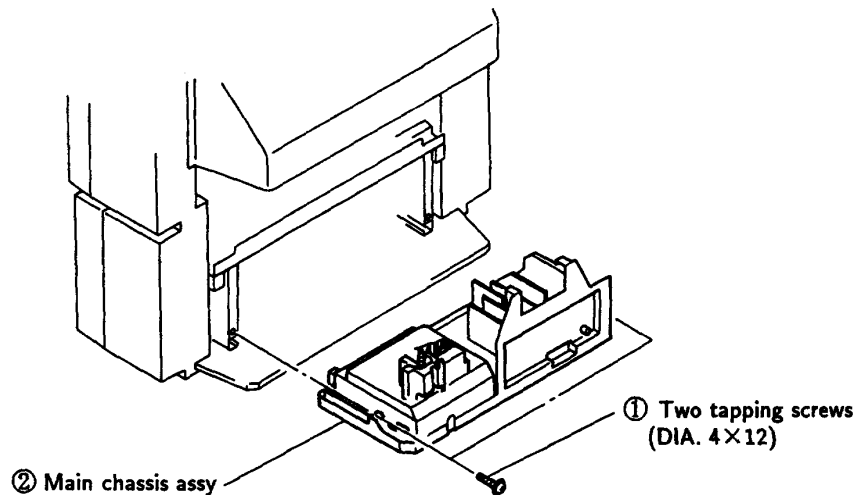
## 2-5. F BRACKET REMOVAL



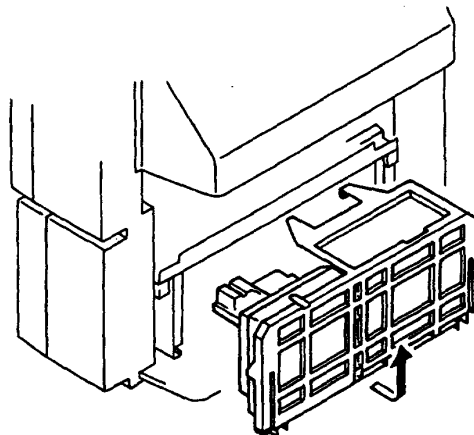


## 2-6. MAIN CHASSIS ASSY REMOVAL AND SERVICE POSITION

### (1) MAIN CHASSIS ASSY REMOVAL



### (2) SERVICE POSITION



### NOTES INSERTED IN SERVICE POSITION SECTION

#### Service Position Procedure

- 1) Remove the path locks where the harness comes into. (MAIN bracket, G shield)
- 2) Remove the following connectors before removing the main bracket.  
※ HV grounding lead, G shield grounding lead, V-2 connector (V board).
- 3) Remove the main bracket. (Take care as the connector leads linking to the C and Z boards are considerably short).
- 4) Before power ON, be sure to connect the connectors removed.

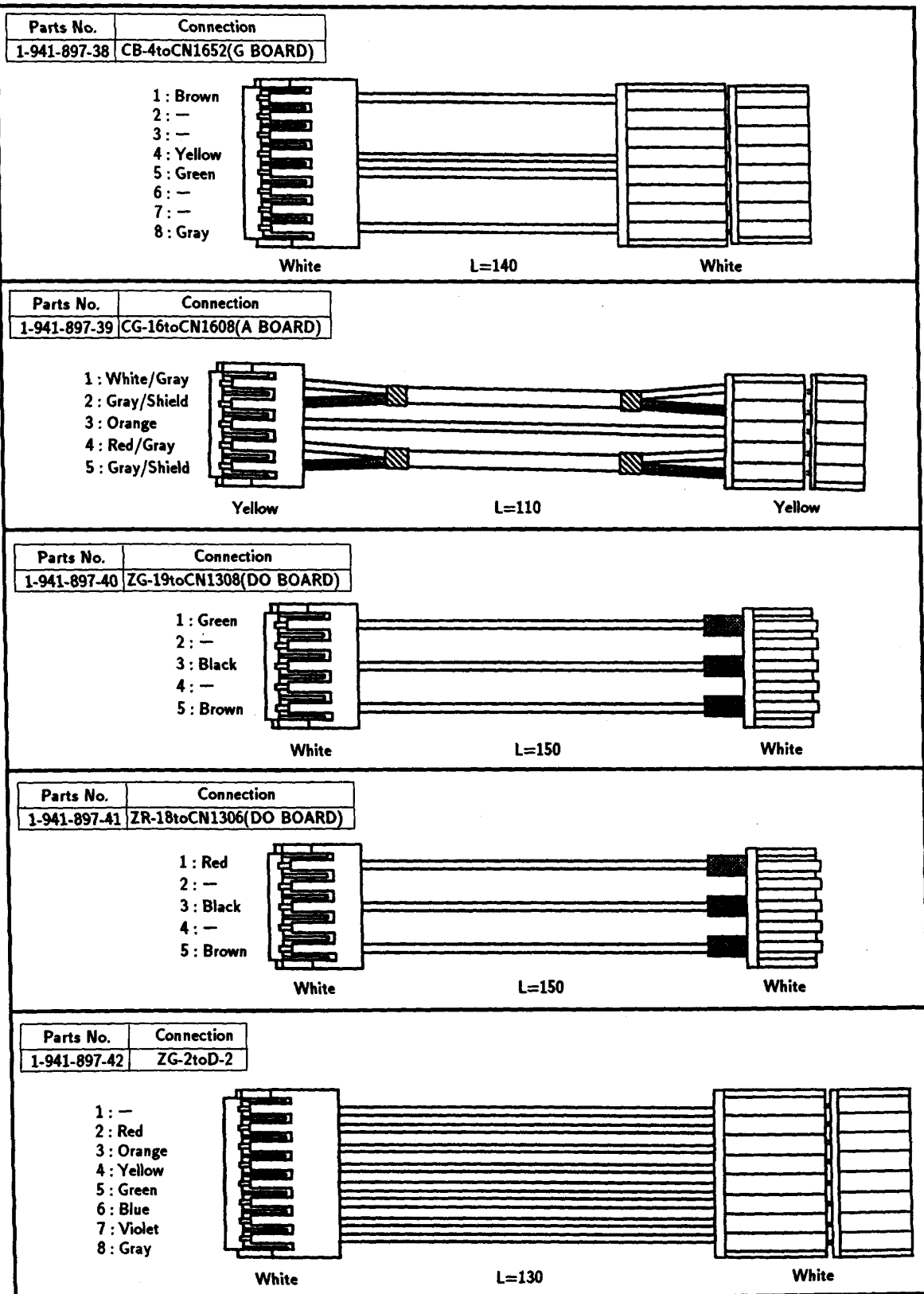
※ HV grounding lead, G shield grounding lead.

In case that grounding lead (Black) of HV Block is not connected with chassis grounding, it causes arcing of CRT and it is dangerous.

Be sure to connect grounding lead of HV Block with chassis grounding.

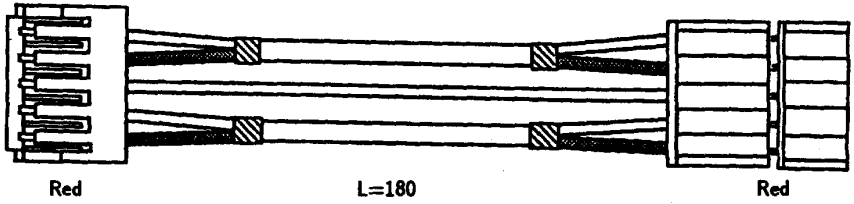
### (3) CONNECTOR CABLES

※ In order to put the set in the service position, use the extension connector cables below.



Parts No.	Connection
1-941-897-43	CR-15toCN1609(A BOARD)

1 : White/Gray  
 2 : Gray/Shield  
 3 : Orange  
 4 : Red/Gray  
 5 : Gray/Shield




Red L=180 Red

---

Parts No.	Connection
1-941-897-44	ZR-1toD-1

1 : Brown  
 2 : Red  
 3 : Orange  
 4 : Yellow  
 5 : Green  
 6 : Blue  
 7 : Violet

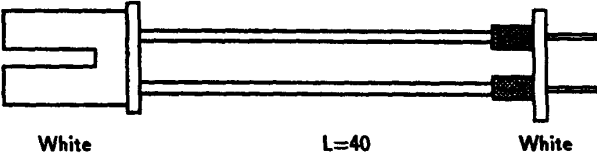


White L=150 White

---

Parts No.	Connection
1-941-897-45	A-21toCRT BRACKET

1 : Black  
 2 : Black

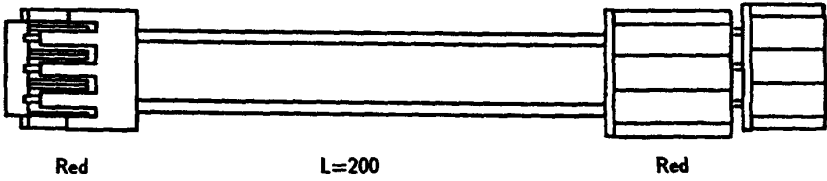


White L=40 White

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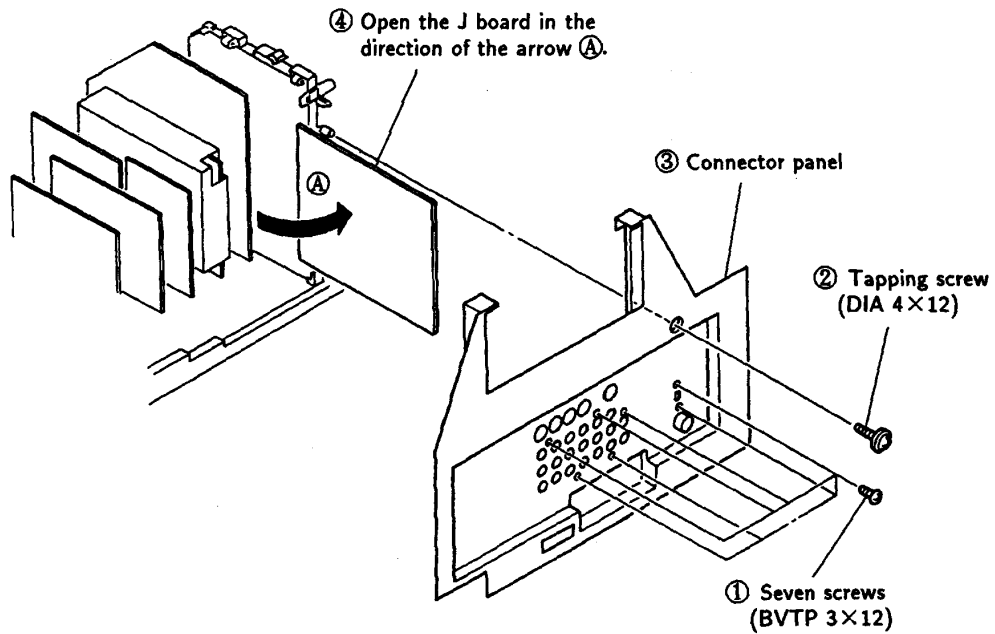
Parts No.	Connection
1-941-897-46	V-2toZR-3

1 : Brown  
 2 : —  
 3 : Red

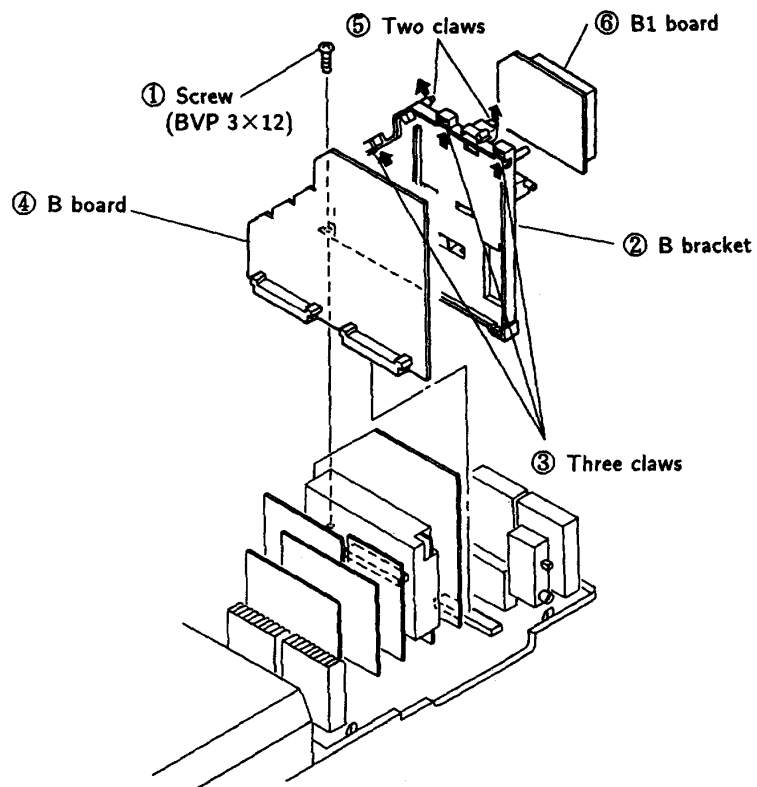


Red L=200 Red

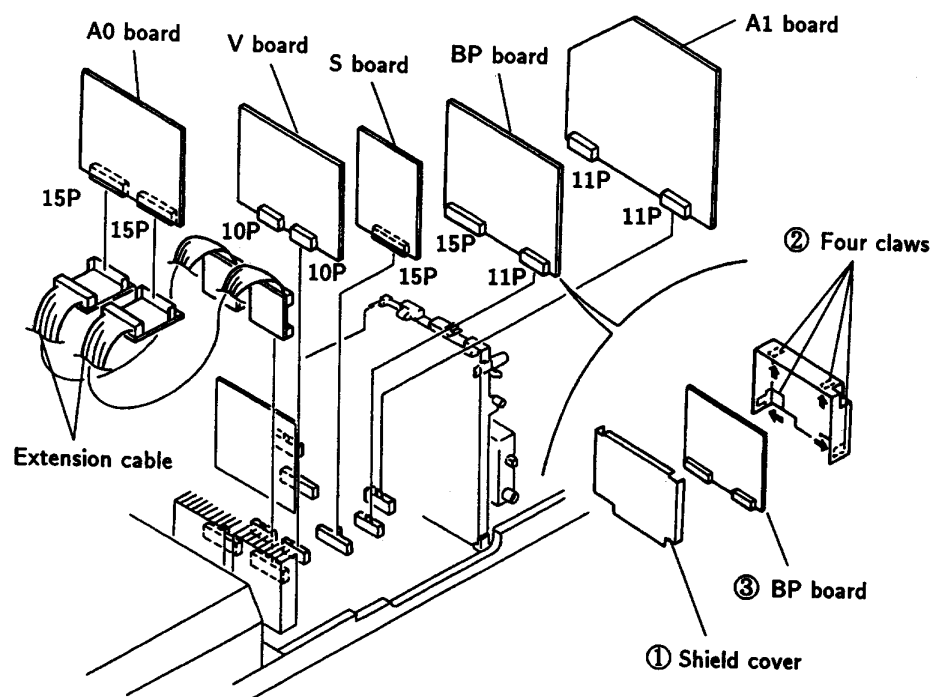
## 2-7. J BOARD REMOVAL



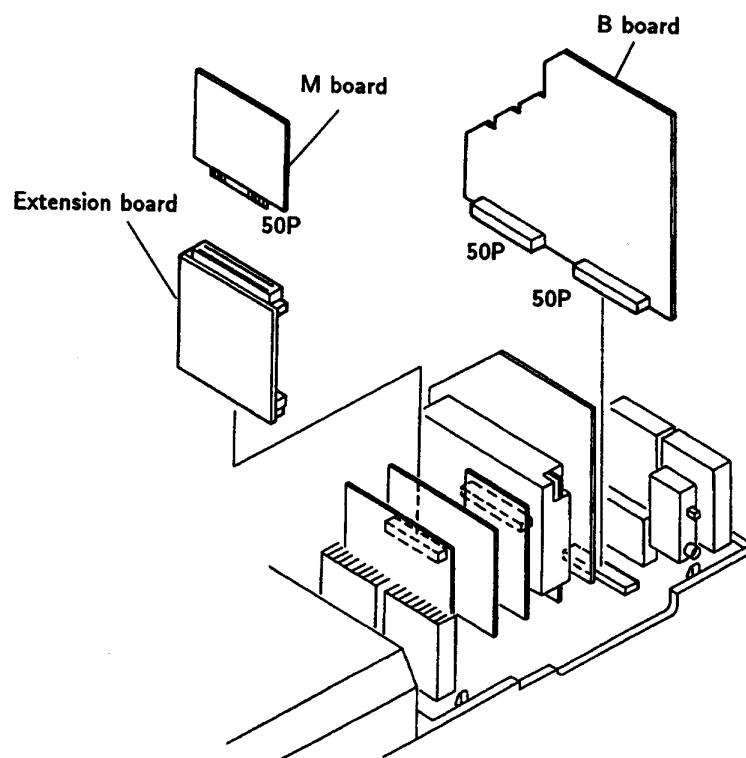
## 2-8. B AND B1 BOARDS REMOVAL




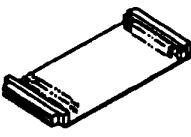
## 2-9. EXTENSION CABLE



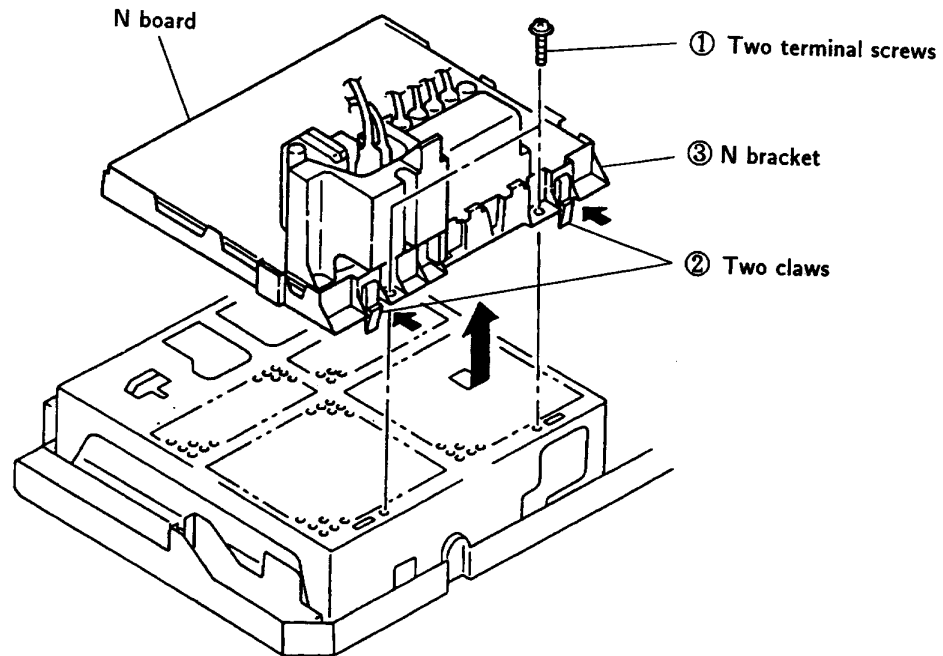
## 2-10. EXTENSION BOARD



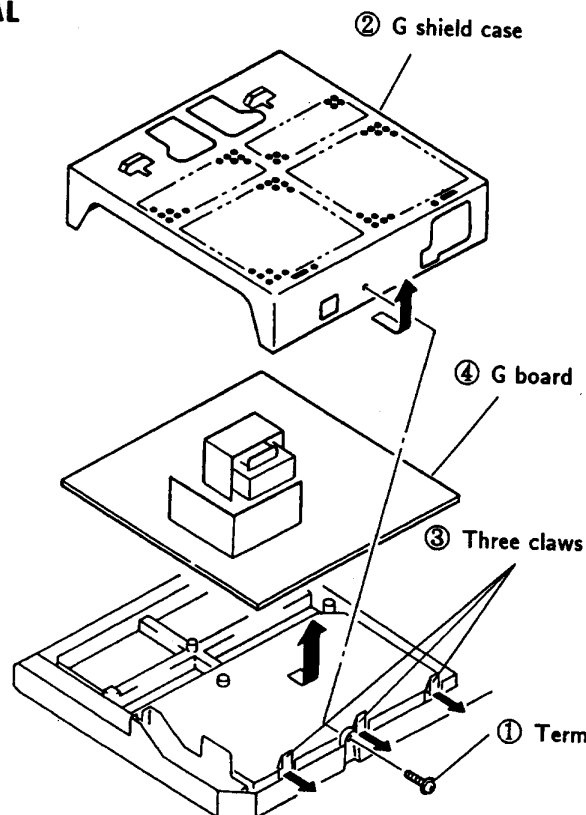
### EXTENSION CABLES AND EXTENSION BOARDS LIST

B board	3-702-556-01	50P	2
V board	3-702-108-01	10P	1
A1 board	3-702-564-01	11P	2
BP board	3-702-564-01	11P	1
	3-702-565-01	15P	1
S board	3-702-565-01	15P	1
A0 board	3-702-565-01	15P	2
M board	3-702-560-01		
	 50pin connector		
M board	3-702-556-01		
	 Extension board		

## 2-11. N BRACKET REMOVAL

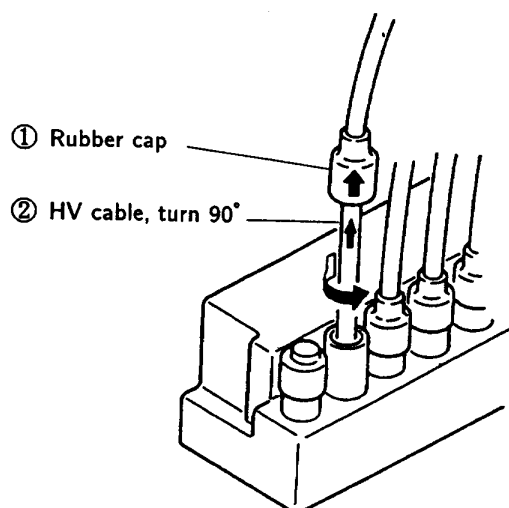


## 2-12. G BOARD REMOVAL

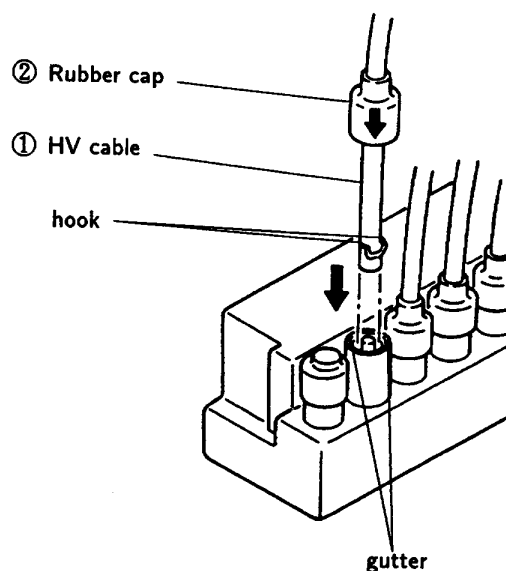


## 2-13. HIGH-VOLTAGE CABLE INSTALLATION AND REMOVAL

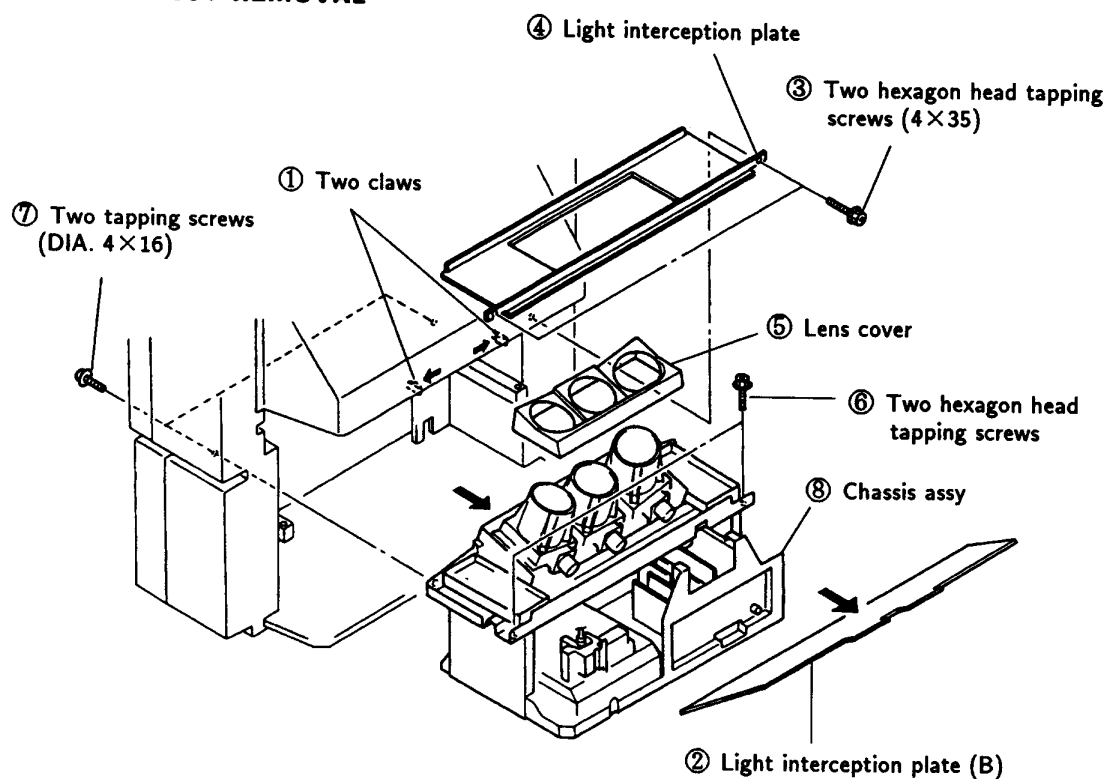
(1) Remover



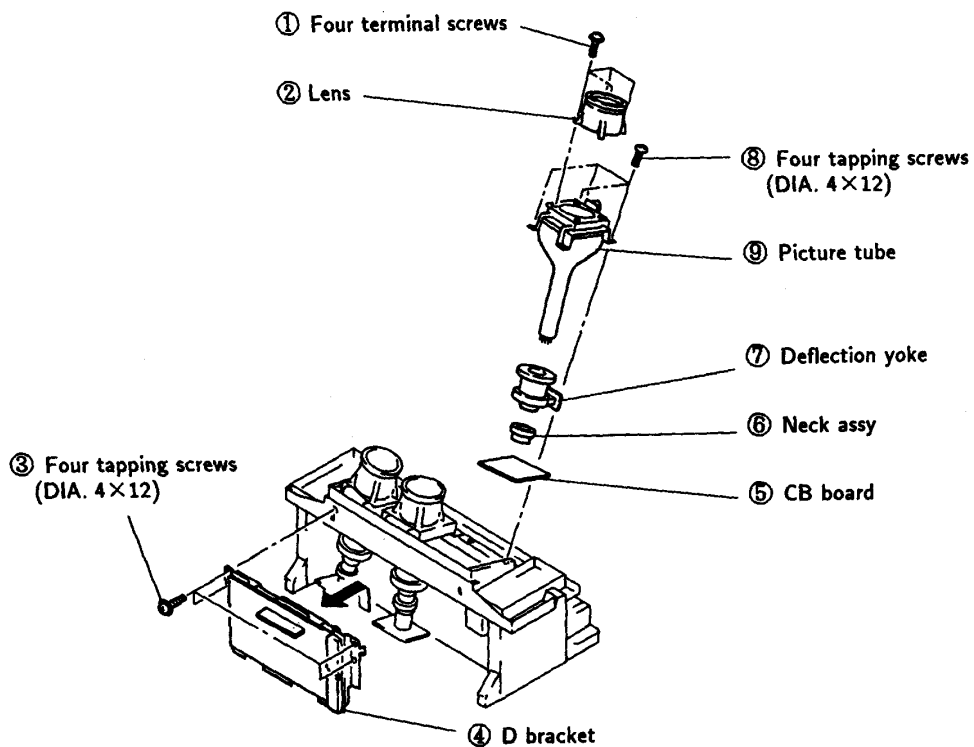
(2) Installation



## 2-14. CHASSIS ASSY REMOVAL



## 2-15. PICTURE TUBE REMOVAL





## 2-16. REPAIR OF CHIP COMPONENT CIRCUIT BOARD

### 2-16-1. POINTS OF COMPONENT REMOVAL

#### Handling of blower type soldering iron

If hot blast is too strong or applied from a slanting direction, small components and solder near the component being removed can be blown off. Do not use blower type without temperature control.

### 2-16-2. NOTES ON SOLDERING FOR CHIP COMPONENTS

- 1) During soldering a chip component, if a soldering iron is applied for a long time, the heat may damage the component or cause pattern peeling.
- 2) Do not reuse a removed component. The characteristics of such a component may deteriorate.
- 3) Use wire solder containing silver ( $\phi$  0.3 or  $\phi$  0.6). (The pin electrodes of the laminated chip capacitor are silver + palladium, so if wire solder which does not contain silver is used, the silver of the pin electrode will be sucked into the solder.)

### 2-16-3. REMOVAL AND MOUNTING OF COMPONENTS

#### Chip resistor and chip capacitor

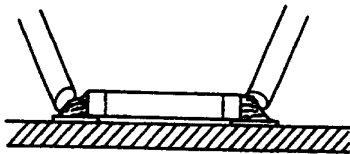
#### REMOVAL

- Using two soldering irons

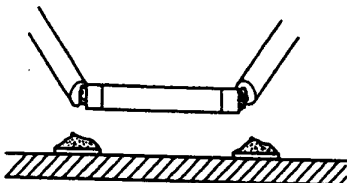
#### 1) Mounted state



#### 2) Melt the solder.

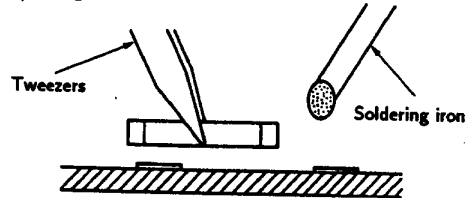


#### 3) Remove the component.



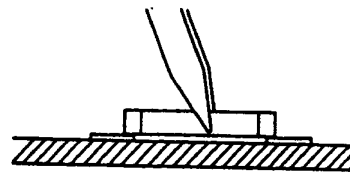
#### SOLDERING

#### 1) Preparation

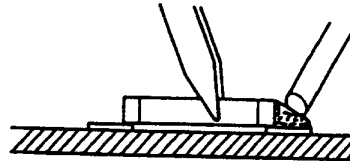


#### 2) Location

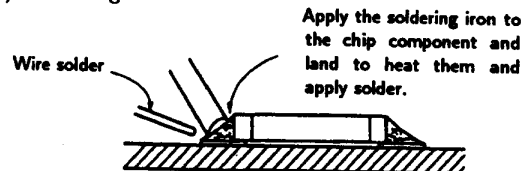
Be careful not to misposition.



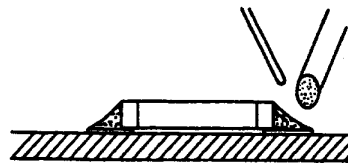
#### 3) Tack soldering and flux application



#### 4) Soldering



#### 5) Soldering (Fix the fillet.)



#### 6) Visual inspection

Check for the following defects :

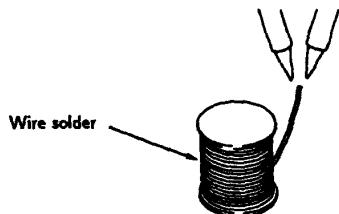
- No-soldered part
- Bridge (to other components or lands)
- Mispositioning
- Other defects

## 2-16-4. MINI-TRANSISTOR

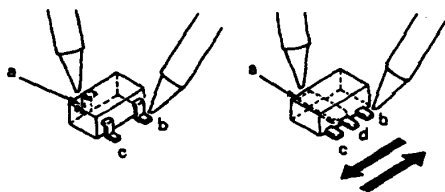
### REMOVAL

- Using two soldering irons

1) Put a little solder on the tip of two soldering irons.



2) Apply the tip of one soldering iron to the point "a" and the other to the points "b" → "c" (or "b" → "d" → "c") and move the component in the directions indicated by arrows in the figure to remove it.

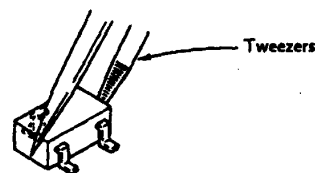


### MOUNTING

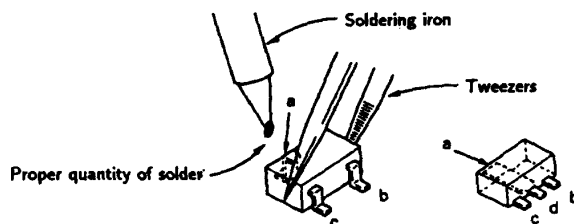
1) Apply a little flux to the land with a brush.



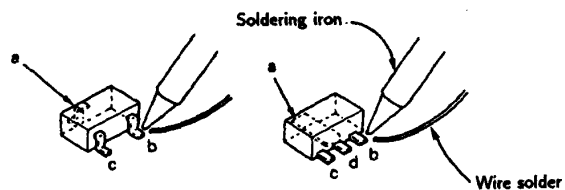
2) Place the component in position using tweezers.



3) Put a little solder on the tip of the soldering iron and solder the point "a" to fix the component.

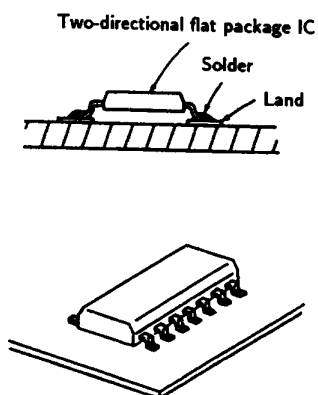


4) Bring the tip of the soldering iron and the wire solder close to the point to be soldered. Solder the points "b" → "c" (or "b" → "d" → "c") in order.

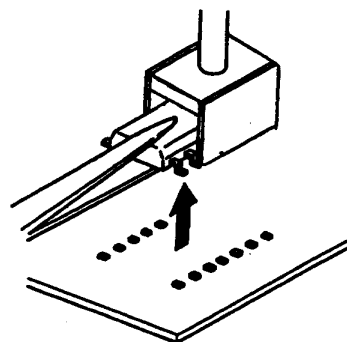


## 2-16-5. TWO-DIRECTIONAL FLAT PACKAGE IC

### MOUNT CONDITION

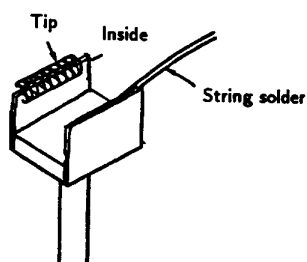


- 3) When the solder melts, lift the IC with a pair of tweezers and remove.



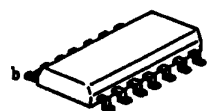
### REMOVAL

- 1) Apply some solder on the inside and the tip of the iron tip jig.

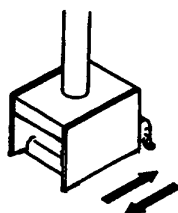


### INSTALLATION

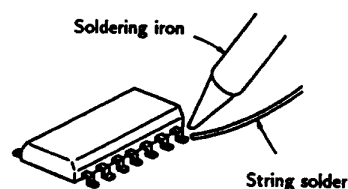
- 1) Place the two-directional flat package IC at the appointed position, solder pins a and b on the diagonal, and fasten it.



- 2) Place the iron tip jig over the IC, and move the jig to and fro as shown in the figure.

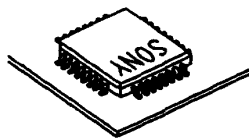
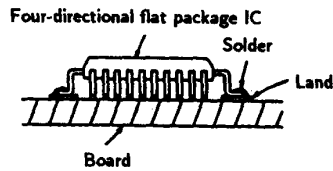


- 2) Solder the remaining pins with the soldering iron.



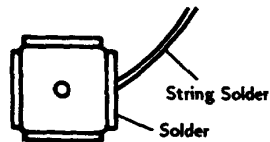
## 2-16-6. FOUR-DIRECTIONAL FLAT PACKAGE IC

### MOUNT CONDITION

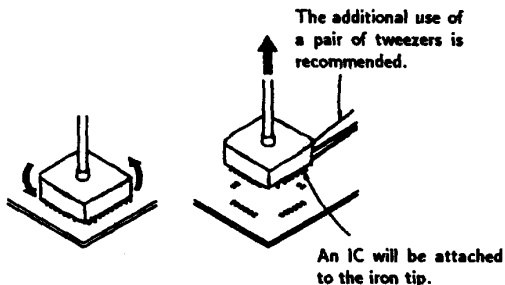


### REMOVAL

- 1) Apply solder on the tip of the iron tip jig.



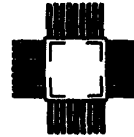
- 2) Place the iron tip jig over the IC, wait about two to three seconds, rotate the iron slightly and lift it up.



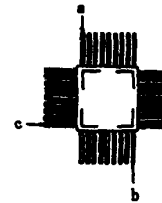
Note: For flat ICs of above 52P, the IC may not be completely attracted when the iron tip jig is lifted up. In these cases, use a pair of tweezers to remove.

### INSTALLATION

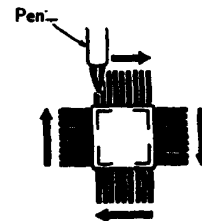
- 1) Place the four-directional flat package IC at the appointed position.



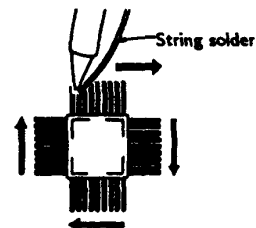
- 2) Apply a slight amount of solder on the iron tip, and solder the three sections in the order of a → b → c, and fix.



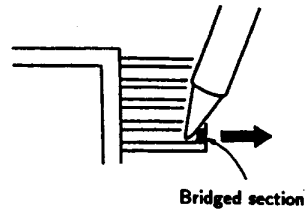
- 3) Apply a slight amount of flux with a pen on all four directions.



- 4) Apply solder on the iron tip and the string solder, and slide and solder in the directions of the arrows.



Note: 1) After soldering, if there are bridged sections, correct by sliding the soldering iron in the direction of the arrow.



If the bridges cannot be corrected using the above method, apply some flux with a pen and try again.

2) Soldering can be carried out more easily by sliding the iron tip near the tip of the IC leg. (Fig. A)

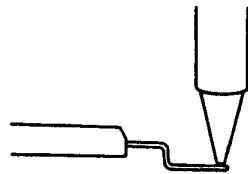


Fig. A

Be careful not to slide the bent sections of the leg as shown in Fig. B as soldering bridges will be formed.

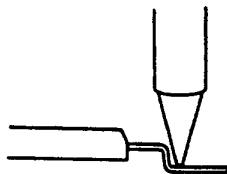
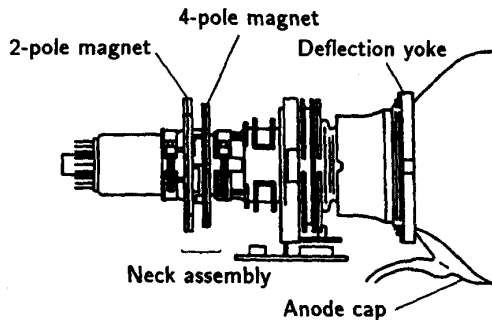


Fig. B

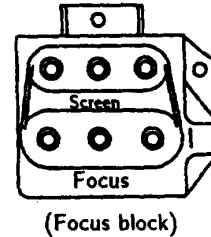
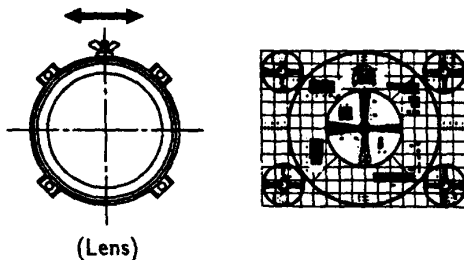
## SECTION 3 SETUP ADJUSTMENTS

### 3-1. FOCUS LENS ADJUSTMENTS

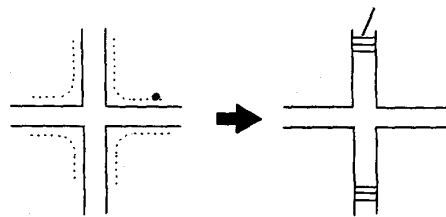
1. Set the D-board registration variable resistor (VR) and the position VR (CENTER VR) to mechanical.
2. Set the centering magnets (for red, green, and blue) to 0 as shown in the figure.



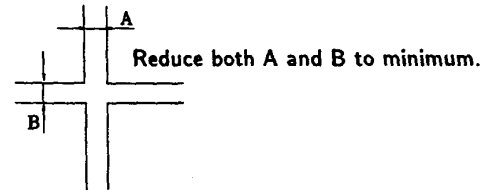
3. Input monoscope signal. Set 50% BRIGHTNESS and minimum PICTURE. Make rough adjustment so that 10IRE of the monoscope signal becomes faintly luminous.
4. Set PICTURE and BRIGHTNESS maximum. Press the commander menu button. Select CONVERGENCE to display test signal.
5. Enter service mode. Select R OFF of SERVICE MODE to cut off red output. Similarly, select B OFF to cut off blue output.
6. Turn the green lens to eliminate flare of the test signal.



Verify that scanning lines are seen.



7. Turn the green focus VR in the focus block to adjust green focus to reduce both A and B of the test signal to minimum.



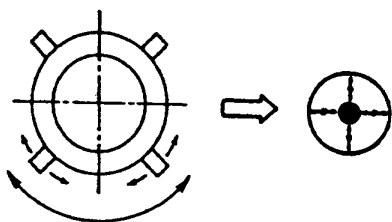
8. Repeat above 7. Couple of times to improve tracking and obtain an optimum lens focus. Then tighten the lens screws.

### 3-2. DEFLECTION YOKE POSITION ADJUSTMENTS

1. Input monoscope signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output. Similarly, select B OFF to cut off blue output.
3. Loosen the deflection yoke (DY) fitting screws. Tilt the DY to obtain the best horizontal and vertical monoscope patterns.
4. After adjustment, press the DY onto the cathode ray tube (CRT) funnel and tighten the screws.
5. Also adjust DY positions for red and blue outputs in the same way.

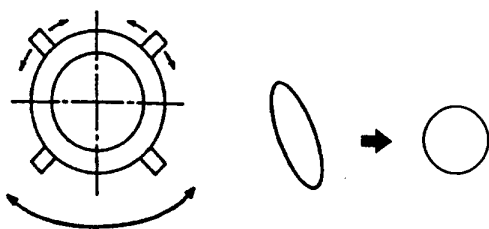
### 3-3. 2-POLE MAGNET ADJUSTMENT

1. Input dot signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.  
Similarly, select B OFF to cut off blue output.
3. Set PICTURE to maximum. Turn the green focus variable resistor (VR) in the focus block counterclockwise to brighten the point in the dot.
4. Adjust the 2-pole magnet to position the bright point at the center of the dot.
5. Adjust the red and blue dots in the same way.



### 3-4. 4-POLE MAGNET ADJUSTMENT

1. Input dot signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.  
Similarly, select B OFF to cut off blue output.
3. Set PICTURE to maximum. Turn the green focus variable resistor (VR) in the focus block clockwise until the dot diameter becomes 15 mm to 20 mm.
4. Adjust the 4-pole magnet to make the dot perfectly round.
5. Adjust the red and blue dot in the same way.



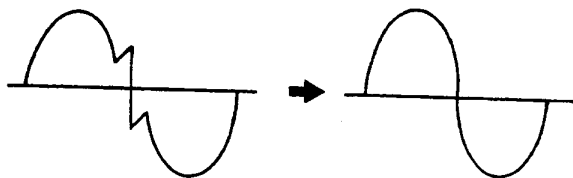
### 3-5. Ds ADJUSTMENT

#### 1) HORIZONTAL WAVE ADJ.

1. Input a PAL color bar signal.
2. Connect the oscilloscope to pin ① of IC1712 on Ds board.
3. Adjust RV984 (horizontal wave) of the waveform.

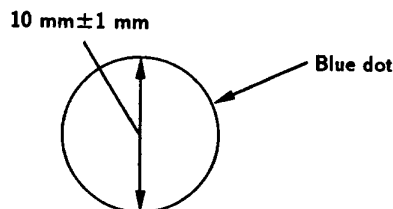
#### 2) VERTICAL WAVE ADJ.

1. Input a PAL color bar signal.
2. Connect the oscilloscope to pin ⑦ of IC1712 on Ds board.
3. Adjust RV983 (vertical wave) of the waveform.



### 3-6. DE-FOCUS ADJUSTMENT (BLUE)

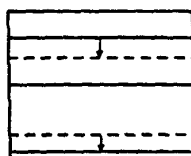
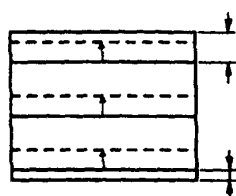
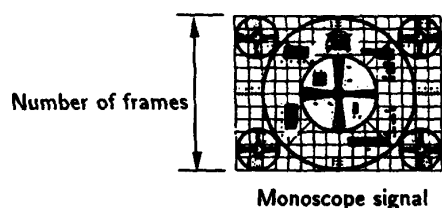
1. Input dot signal.
2. Turn the blue focus variable resistor (VR) in the focus block counter clock wise so that the diameter of the blue dot becomes  $10 \pm 1$  mm.



### 3-7. GREEN PICTURE ADJUSTMENTS

1. Input monoscope signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.  
Similarly, select B OFF to cut off blue output.
3. Turn RV913 and RV960, the vertical green linearity variable resistors (V.G LIN VRs) on the D-board, to obtain an optimum vertical linearity. Then turn RV911, the vertical green amplitude variable resistor (V.G SIZE VR) to set vertical amplitude to  $11.2 \pm 0.2$  frames.

Note: The vertical position indicator of the monoscope signal must be positioned at the center by adjusting RV905, the vertical green center position variable resistor (V.G CENT VR) in advance.

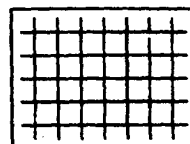


RV905 V.G CENT  
(vertical position)

RV911 V.G SIZE  
(vertical amplitude)

RV913 V.G LIN  
RV960 M. LIN. S

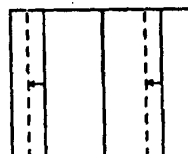
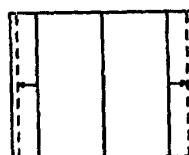
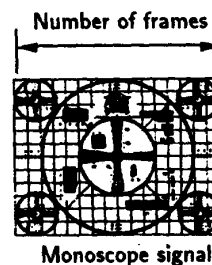
4. Verify that the horizontal lines on the top and bottom of cross-hatched area of the monoscope signal are horizontal and linear.



5. Turn RV916, RV964 and RV969, the horizontal green linearity variable resistors (H.G LIN VRs) on the D-board, to obtain an optimum horizontal linearity.

Then turn RV908, the horizontal green amplitude variable resistor (H.G SIZE VR) to set horizontal amplitude to  $14.8 \pm 0.2$  frames.

Note: The horizontal position indicator of the monoscope signal must be positioned at the center by adjusting RV902, the horizontal green center position variable resistor (V.G CENT VR) in advance.



RV908 H.G SIZE  
(horizontal position)

RV916 H.G LIN  
RV964 M. LIN. S  
RV969 M. LIN. L  
(horizontal linearity)

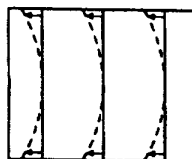


6. Input cross hatch signal.  
Turn vertical green (V.G) and horizontal green (H.G) variable resistors (VRs) and make adjustments according to the following steps.

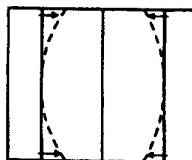
(Adjustment procedure)

1. [BOW] → [SKEW] → [CENT (center position)]
2. [PIN (pin warp)] → [SUB BOW] → [BOW]
3. [KEYS (trapezoid)] → [SUB SKEW] → [SKEW]
4. [M.WAVE (middle sine wave warp)] →  
[WAVE-A (upper and lower sine wave warp)] →  
[WAVE-U (upper sine wave warp)]  
※ For vertical (V) only.
5. [V-M.PIN (vertical middle pin warp)] →  
[V/WING (vertical wing warp)]  
※ For vertical (V) only.
6. [H-M.PIN (horizontal middle pin warp)]  
※ For horizontal (H) only.

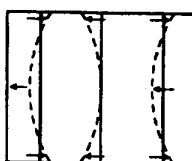
(Dot motion)




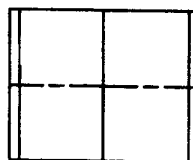
  
RV932 H.G BOW  
(horizontal green bow)



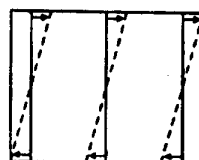
  
RV941 H.G PIN  
(horizontal green pin warp)



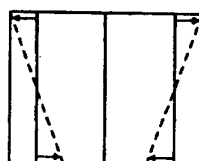
  
RV950 H.G SUB BOW  
(horizontal green sub bow)



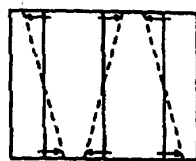
V.G BOW	.....	RV935
V.G PIN	.....	RV938
V.G SUB BOW	.....	RV953




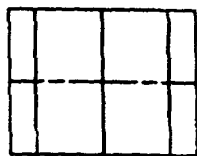
  
RV920 H.G SKEW  
(horizontal green skew)



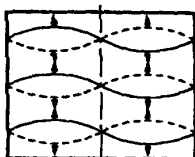
  
RV925 H.G KEYS  
(horizontal green trapezoid)



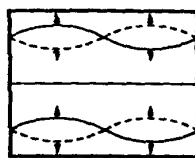
  
RV944 H.G SUB SKEW  
(horizontal green sub skew)




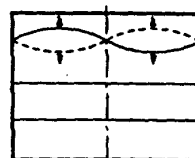
V.G SKEW	.....	RV923
V.G KEYS	.....	RV929
V.G SUB SKEW	.....	RV947




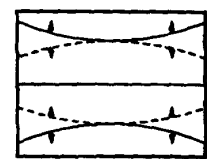
  
RV962 V-M-WAVE  
(vertical middle sine wave warp)




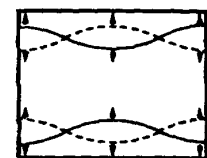
  
RV975 V-WAVE-A  
(vertical upper and lower  
sine wave warp)




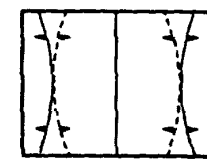
  
RV978 V-WAVE-U  
(vertical upper sine wave warp)



  
RV980 V-M. PIN  
(vertical middle pin warp)  
※ Common in red, green,  
and blue



  
RV957 V/WING  
(wing warp)  
※ Common in red, green,  
and blue



  
RV956 H/M. PIN  
(vertical middle pin warp)

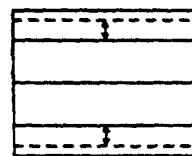
### 3-8. GREEN AND RED REGISTRATION ADJUSTMENTS

1. Input cross hatch signal.
2. Enter service mode. Select B OFF of SERVICE MODE to cut off blue output.
3. Turn the vertical red (V.R) and horizontal red (H R) variable resistors (VRs) to adjust red picture convergence in relation to green picture according to the following steps:

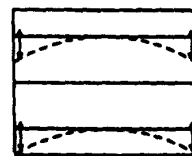
(Adjustment procedure)


1. [LIN (linearity)] → [SIZE (amplitude)] → [CENT (center position)] →
  2. [BOW] → [SKEW] → [CENT (center position)]
  3. [PIN (pin warp)] → [SUB BOW] → [BOW] [H/M. PIN (horizontal middle pin warp)]
  4. [KEYS (trapezoid)] → [SUB SKEW] → [SKEW]
  5. [M.WAVE (middle sine wave warp)] → [WAVE-A (upper and lower sine wave warp)] → [WAVE-U (upper sine wave warp)]
- ※ For vertical (V) only.

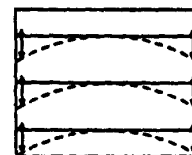
(Dot motion)




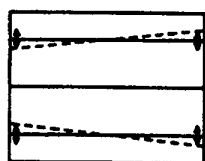
  
RV912 V.B SIZE  
(vertical red amplitude)



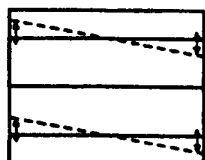
  
RV952 V.R SUB BOW  
(vertical red sub bow)




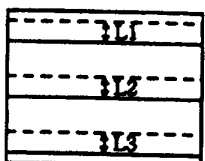
  
RV943 V.R BOW  
(vertical red bow)



 RV928 V.R KEYS  
(vertical red trapezoid)



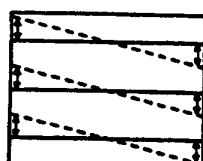
 RV946 V.R SUB SKEW  
(vertical red sub skew)



 RV904 V.R CENT  
(vertical red center position)



 RV917 V.R LIN  
(vertical red linearity)



 RV922 V.R SKEW  
(vertical red skew)

H.R LIN	.....	RV915
H.R SIZE	.....	RV907
H.R CENT	.....	RV901
H.R BOW	.....	RV931
H.R SKEW	.....	RV919
H.R PIN	.....	RV940
H.R KEYS	.....	RV926
H.R SUB BOW	.....	RV949
H.R SUB SKEW	.....	RV943
V-M-WAVE	.....	RV973
V-WAVE-A	.....	RV976
V-WAVE-U	.....	RV979
V-M.PIN	.....	RV980
V/WING	.....	RV957
H/M.PIN	.....	RV956

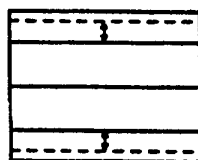
### 3-9. GREEN AND BLUE REGISTRATION ADJUSTMENTS

1. Input cross hatch signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.
3. Turn the vertical blue (V.B) and horizontal blue (H.B) variable resistors (VRs) to adjust blue picture convergence in relation to green picture according to the following steps:

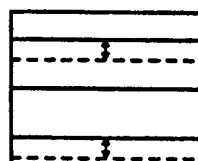
(Adjustment procedure)

1. [LIN (linearity)] → [SIZE (amplitude)] → [CENT (center position)] →
2. [BOW] → [SKEW] → [CENT (center position)]
3. [PIN (pin warp)] → [SUB BOW] → [BOW] [H/M. PIN (horizontal middle pin warp)]
4. [KEYS (trapezoid)] → [SUB SKEW] → [SKEW]
5. [M.WAVE (middle sine wave warp)] → [WAVE-A (upper and lower sine wave warp)] → [WAVE-U (upper sine wave warp)] →

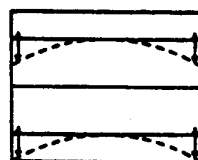
(Dot motion)




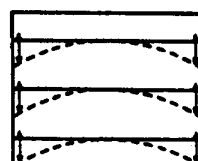
 RV912 V.B SIZE  
(vertical blue amplitude)



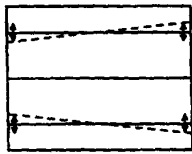
 RV918 V.B LIN  
(vertical blue linearity)



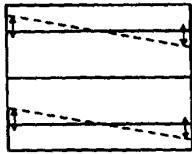
 RV954 V.B SUB BOW  
(horizontal blue sub bow)



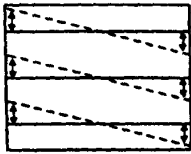
 RV936 V.B BOW  
(vertical blue bow)



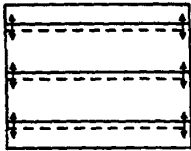
RV930 V.B KEYS  
(vertical blue trapezoid)



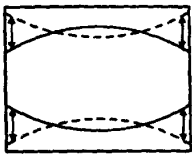
RV948 V.B SUB SKEW  
(vertical blue sub skew)



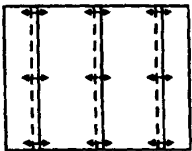
RV924 V.B SKEW  
(vertical blue skew)



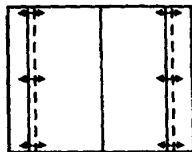
RV906 V.B CENT  
(vertical blue center position)



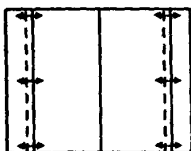
RV939 V.B PIN  
(vertical blue pin warp)



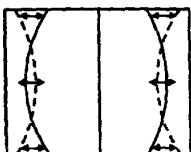
RV903 H.B CENT  
(vertical blue center position)



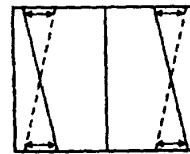
RV909 H.B SIZE  
(horizontal blue amplitude)



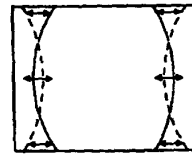
RV914 H.B LIN  
(horizontal blue linearity)



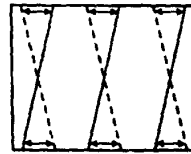
RV942 H.B PIN  
(horizontal blue pin warp)



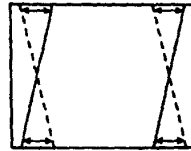
RV945 H.B SUB SKEW  
(horizontal blue sub skew)



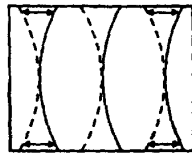
RV951 H.B SUB BOW  
(horizontal blue sub bow)



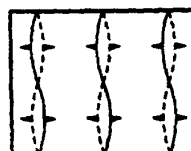
RV921 H.B SKEW  
(horizontal blue skew)



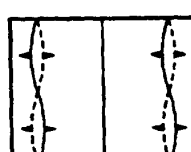
RV927 H.B KEYS  
(horizontal blue trapezoid)



RV933 H.B BOW  
(horizontal blue bow)



RV981  
※ Common in red,  
green, and blue



RV982  
※ Common in red,  
green, and blue

H/M PIN	.....	RV958
M.WAVE	.....	RV961
WAVE-A	.....	RV974
WAVE-U	.....	RV977

## SECTION 4 CIRCUIT ADJUSTMENTS

### 4-1. ADJUSTMENTS WITH COMMANDER

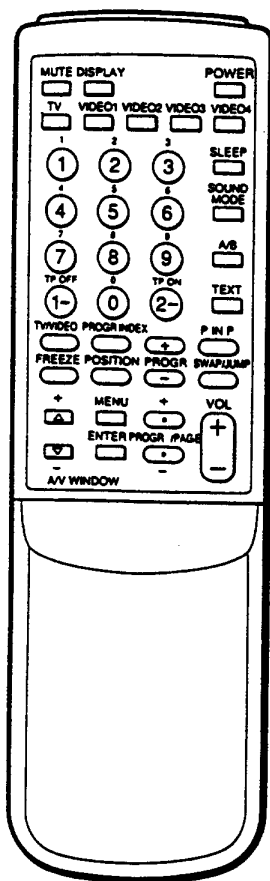
Service adjustments are made with the RM-821 that comes with this unit.

#### Entering service mode

With the unit on standby

↓  
"DISPLAY"  
↓  
"5"  
↓  
"VOL (+)"  
↓  
"POWER"

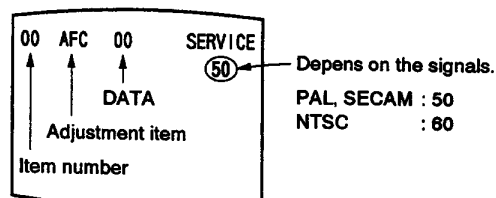
This operation sequence puts the unit into service mode.



"1", "4" Raise/lower the service item number  
"3", "6" Raise/lower the data  
"MUTE" Writes  
"0" Executes the writing

"7", "0" The data all becomes the values in memory  
"8", "0" User control all goes to the standard state  
"9" H-FRE automatic adjustment  
"5", "0" Service data initialization (Besure not to use usually.)  
"2", "0" Write 50 Hz adjustment data to 60 Hz, or in opposition.

The screen display is:



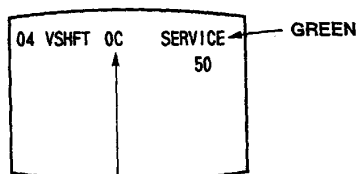
"1", "4" Select the adjustment item.  
↓  
"3", "6" Raise/lower the data.  
↓  
"MUTE" Writes.  
↓  
"0" Executes the writing.

## 4-2. ADJUSTMENT METHOD

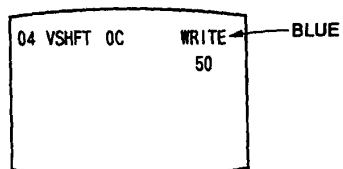
Item Number 04

This explanation uses VSHFT as an example.

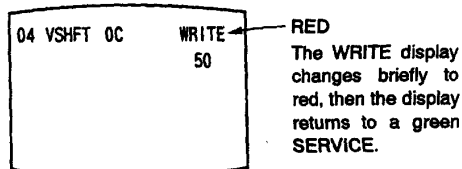
1. Select 04 VSHFT with the "1" and "4" buttons.
2. Raise/lower the data with the "3" and "6" buttons.
3. Select the optimum state. (The standard is for OF PAL reception.)
4. Write with the MUTE button. (The display changes to blue WRITE.)
5. Execute the writing with the "0" button. (The WRITE display changes briefly to red.)



Adjusted with "3" and "6" buttons



Written with "MUTE"



Write executed with "0"

Use the same method for Items Number 00 - 50. Use "1" and "4" to select the adjustment item, use "3" and "6" to adjust, write with "MUTE", then execute the write with "0".

**Note:** In "WRITE", the data of all items are wrote together to memory.

- H-FRE can be adjusted automatically. Feed a standard signal and input "9", the automatic adjustment is executed.

- As for VFREQ, by searching the bolded screen V range with adjusting data.

**Note:** In item 02 50 Hz, or item 03 60 Hz, it operates normally in spite of the 50 Hz or the 60 Hz of the input signal. Therefore be suure to adjust data according to the input signal.

## AN ITEM OF ADJUSTMENT

LABSEL	ITEM	DATA SPHERE	STANDARD *		NAME REGISTER
			50 Hz	60 Hz	
0	AFC	00~03	00:00		AFC SW
1	HFRE	00~7 F	45:40		H FREQUENCY
2	VFR 5	00~1 F	0F		V FREQUENCY 50
3	VFR 6	00~1 F	0F		V FREQUENCY 60
4	VSFT	00~1 F	0C:0C		V SHIFT
5	VSIZ	00~3 F	26:27		V SIZE
6	VLIN	00~0 F	07:07		V LINEARITY
7	VSCO	00~0 F	07:07		V S CORRECT
8	HPHA	00~0 F	03:05		H SENT
17	VSM 5	00~01	00		V LOCK RANGE SW 50
18	VSM 6	00~01	00		V LOCK RANGE SW 60
28	SPIC	00~1 F	0 D		SUB PICTURE
29	SHUE	00~1 F	0 D		SUB HUE
30	SCOL	00~1 F	0 D		SUB COLOR
31	SBRT	00~1 F	0 D		SUB BRIGHTNESS
32	SSHP	00~1 F	0 D		SUB SHARPNESS
33	SBAL	00~1 F	0 D		SUB BALANCE
34	VM	00~02	00		VM ON/OFF/NR SYNC.
35	MDSH	00~3 F	35		MAIN SCREEN DISPLAY POSITION H DIRECTION
36	SDSH	00~3 F	0 E		PI P SCREEN DISPLAY POSITION H DIRECTION
37	PIPH	00~3 F	20:20		PinP H CENT POSITION
38	PIPV	00~0 F	08:08		PinP V CENT POSITION
39	PIPL	00~0 F	08		PinP OUT LEVEL
40	PIPC	00~07	04		PinP FRAME COLOR
41	PIPD	00~07	00:00		PinP DELAY
42	PIVS	00~07	04:04		PinP V CORRECT
43	PIHS	00~0 F	07:04		PinP H CORRECT
44	TXPC	00~0 F	05		TEXT PICTURE
45	BLUE	00~02	00		NO SIGNAL BLUE BACK Yes/No
46	OSD	00~01	00		SCREEN DISPLAY START POSITION
47	MDSV	00~1 F	0 F		MAIN SCREEN DISPLAY POSITION V DIRECTION
48	DEGA	00~01	※		DEGAUSS ON/OFF
49	ONDL	00~FF	80		POWER ON DELAY TIME
50	MUTE	00~01	01		NO SIGNAL SOUND MUTE Yes/No
51	GAMP	00~1 F	0 F		G DRIVE
52	BAMP	00~1 F	0 F		B DRIVE
53	GCUT	00~0 F	07		G CUT OFF
54	BCUT	00~0 F	07		B CUT OFF
55	SBR 2	00~1 F	0 D		SUB BRIGHTNESS
56	IK	00~03	01		IK REF PULSE
57	R-ON	00~01	01		R ON
58	G-ON	00~01	01		G ON
59	B-ON	00~01	01		B ON
60	ABLM	00~01	00		ABL MODE

\* 50 : PAL input signal standard

\* 60 : NTSC input signal standard

Notes : 08 H-PHA is adjusted with data 00-07.

34 VM does not function.

46 OSD is set to 0.

48 DEGA is set to 1.

49 OND is set to 80.

39 PIPL is set to 01 for M37204M8-A10SP (M M't IC 005)  
08 for M37204M8-xxx

50 MUTE can not be selected for M37204M8-A10SP

32 SSHP is set to 03 for M37204M8-A10SP  
0D for M37204M8-xxx

### 4-3. PICTURE QUALITY ADJUSTMENTS

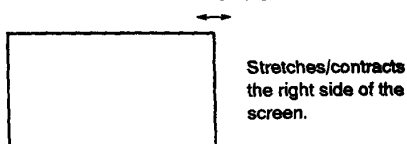
Item Numbers 28 – 33

SPIC	}	When it is out of order in the user 50% condition, be sure to adjust.
SHUE		
SCOL		
SBRT		
SSHP	}	Set to the standard values.
SBAL		

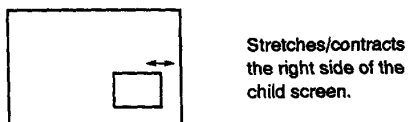
### 4-4. DISPLAY POSITION ADJUSTMENT

Item Numbers 35 – 43

35 MDSH Main screen display position, horizontal



36 SDSH PinP screen display position

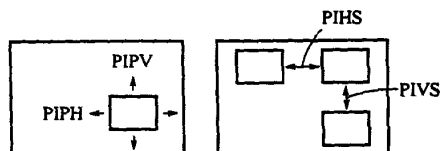


37 PIPH Pin-P horizontal position correction

38 PIPV Pin-P vertical position correction

42 PIVS Pin-P vertical correction

43 PIHS Pin-P horizontal correction



- When pressing PIP "POSITION" key in the service mode, "POSITION" turns round and round automatically.

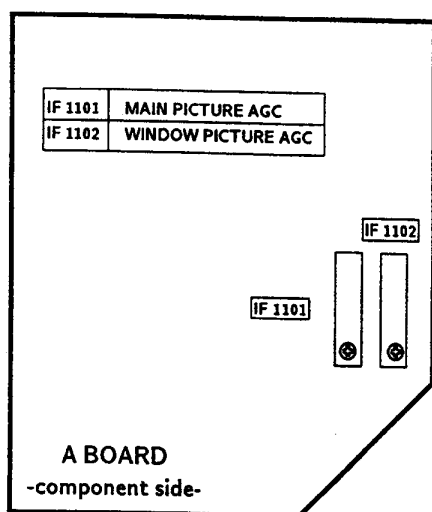
Item Numbers 39 – 41 and 47 are set to the standard values.

44 TXPIC Text picture

Corrects the brightness for when teletext is received.  
Standard value is 05.



#### 4-5. A BOARD ADJUSTMENTS



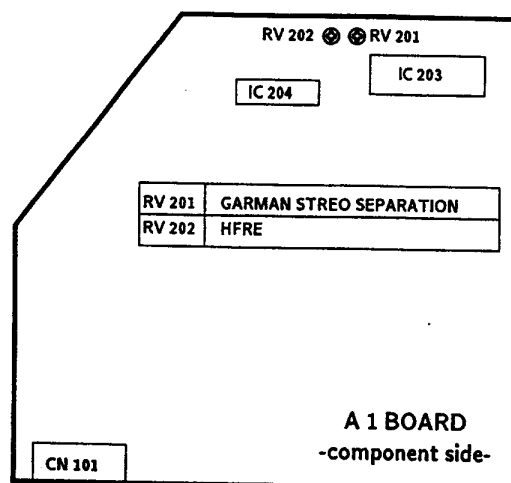
##### Main screen AGC adjustment (IF1101)

1. Receive an off-air signal.
2. Adjust the IF1101 RF AGC VR so that there is no snow noise or cross-modulation.
3. Switch the channel and verify the adjustment.

##### PinP screen AGC adjustment (IF1102)

1. Receive an off-air signal.
2. Adjust the IF1102 RF AGC VR so that there is no snow noise or cross-modulation.
3. Switch the channel and verify the adjustment.

#### 4-6. A1 BOARD ADJUSTMENTS



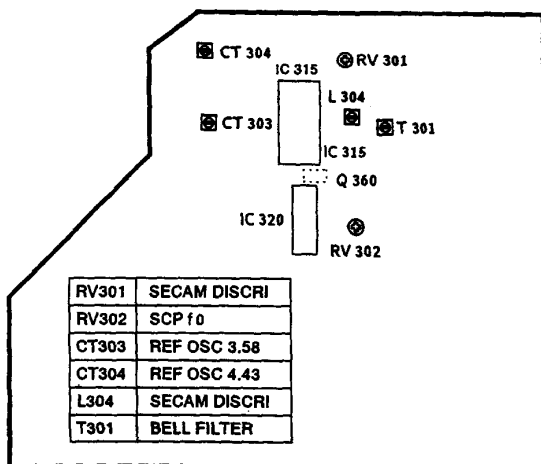
##### German stereo separation adjustment (RV201)

1. Input a 400 Hz signal to the left and a 1 kHz signal to the right.
2. Connect an oscilloscope to Pins ⑧ and ⑨ of CN101.
3. Adjust RV201 so that a 400Hz sine wave is output from Pin ⑧ and a 1 kHz sin wave is output from Pin ⑨.

##### Horizontal frequency adjustment (RV202)

1. Connect Pin ⑫ of IC204 to ground.
2. Receive a PAL color bar signal.
3. Connect a frequency counter to Pin ⑫ of IC203.
4. Adjust RV202 for a frequency of  $15625 \pm 50$  Hz.
5. Remove the ground from Pin ⑫ of IC204.

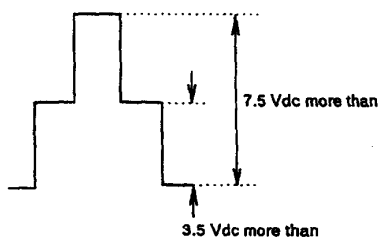
#### 4-7. B BOARD ADJUSTMENTS



B BOARD (MAIN PICTURE)  
-component side-

##### SCP f<sub>0</sub> adjustment (RV302)

1. Connect Pin ⑫ of IC320 to ground.
2. Connect a frequency counter to Pin ④ of IC320.
3. Adjust RV302 for a frequency of 15.625 kHz.
4. Check that the SCP pulse is output at Pin ⑥ of IC320.



5. Remove the ground from Pin ⑫ of IC320.

##### Reference oscillation adjustment (CT304)

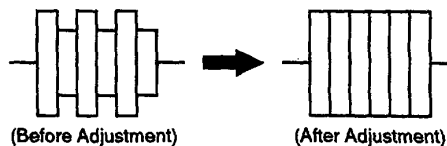
1. Connect Pin ⑮ of IC315 to ground.
2. Input a PAL color bar signal.
3. Adjust CT304 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑮ of IC315.

##### Reference oscillation adjustment (CT303)

1. Connect Pin ⑮ of IC315 to ground.
2. Input a 3.58 NTSC color bar signal.
3. Adjust CT303 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑮ of IC315.

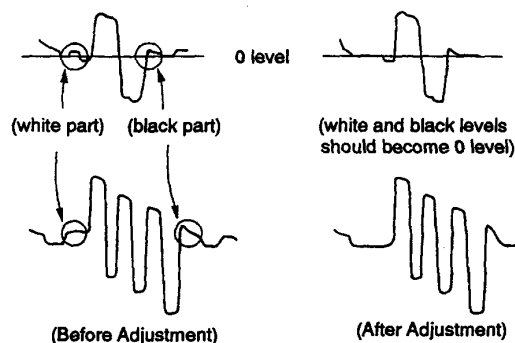
##### Bell filter adjustment (T301)

1. Input a SECAM color bar signal.
2. Connect an oscilloscope to the emitter of Q360.
3. Adjust T301 so that the waveform is flat.

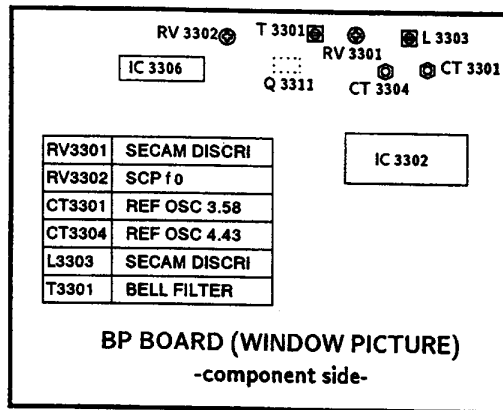


##### SECAM DISCRI adjustment (RV301, L304)

1. Input a SECAM color bar signal.
2. Connect an oscilloscope to Pin ① of IC315.
3. Adjust RV301 so that the sections corresponding to white and black are at 0 level.
4. Connect the oscilloscope to Pin ③ of IC315.
5. Adjust L304 so that the sections corresponding to white and black are at 0 level.
6. Carry out the 2 - 5 tracking.

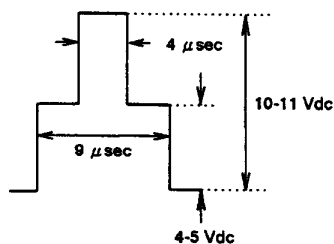


#### 4-8. BP BOARD ADJUSTMENTS (PinP screen)



##### SCP fo adjustment (RV3302)

1. Connect Pin ⑫ of IC3306 to ground.
2. Connect a frequency counter to Pin ④ of IC3306.
3. Adjust RV3302 for 15.625 kHz.
4. Check that the SCP pulse is output at Pin ⑥ of IC3306.



5. Remove the ground from Pin ⑫ of IC3306.

##### Reference oscillation adjustment (CT3304)

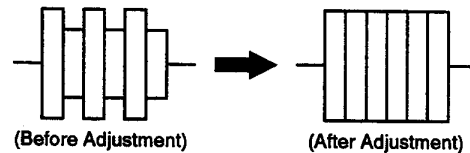
1. Connect Pin ⑰ of IC3302 to ground.
2. Input a PAL color bar signal to the PinP screen.
3. Adjust CT3304 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑰ of IC3302.

##### Reference oscillation adjustment (CT3301)

1. Connect Pin ⑰ of IC3302 to ground.
2. Input a 3.58 NTSC color bar signal.
3. Adjust CT3301 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑰ of IC3302.

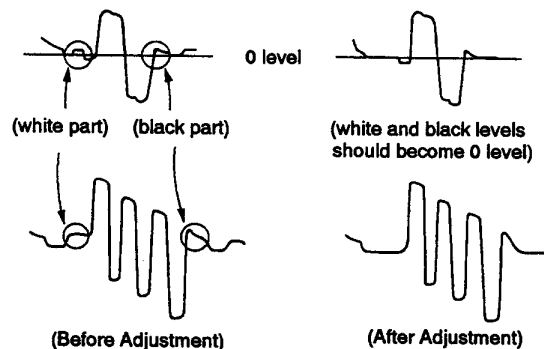
##### Bell filter adjustment (T3301)

1. Input a SECAM color bar signal.
2. Connect an oscilloscope to the emitter of Q3311.
3. Adjust T3301 so that the waveform is flat.

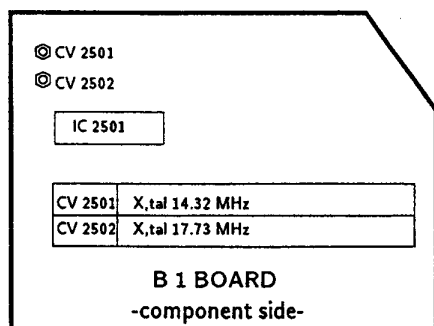


##### SECAM DISCRI adjustment (RV3301, L3303)

1. Input a SECAM color bar signal.
2. Connect an oscilloscope to Pin ① of IC3302.
3. Adjust RV3301 so that the sections corresponding to white and black are at 0 level.
4. Connect the oscilloscope to Pin ③ of IC3302.
5. Adjust L3303 so that the sections corresponding to white and black are at 0 level.
6. Carry out the 2 - 5 tracking.



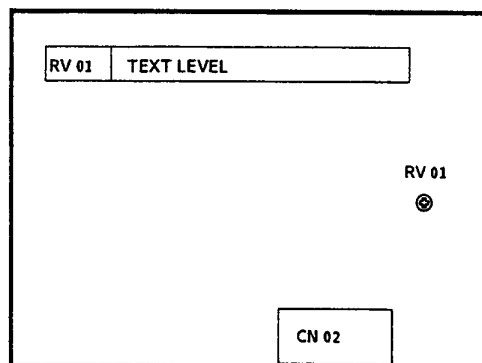
#### 4-9. B1 BOARD ADJUSTMENT



##### Crystal adjustment (CV2502)

1. Put the unit into the no-signal state.
2. Select PAL with COLOR SYSTEM.
3. Connect a frequency counter to Pin ⑪ of IC2501.
4. Adjust CV2502 for a frequency of 17.73447 MHz  $\pm$  100 Hz.
5. Select NTSC with COLOR SYSTEM.
6. Adjust CV2501 for a frequency of 14.31818 MHz  $\pm$  100 Hz.

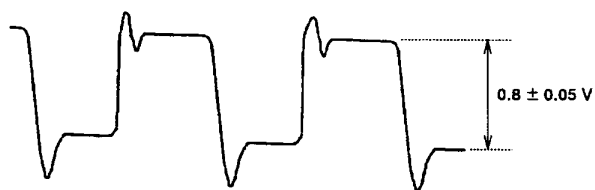
#### 4-10. V BOARD ADJUSTMENT



**V BOARD**  
-component side-

##### Text level adjustment (RV01)

1. Receive a teletext signal.
2. Connect an oscilloscope to Pin ④ of CN02.
3. Adjust RV01 for a voltage of  $0.5 \pm 0.05$  V.

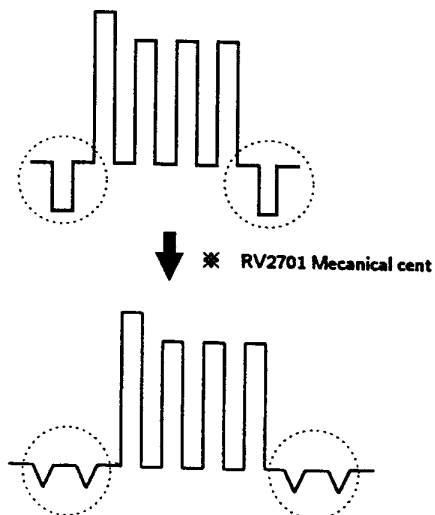


**Note:** The item 44 TXPIC should be set to 05 value in the service mode.

#### 4-11. A0 BOARD ADJUSTMENT

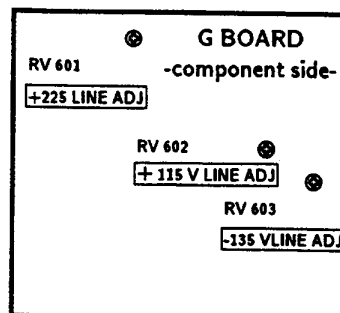
##### RGB pedestal adjustment (RV2704)

1. Input a PAL color-bar signal.
2. Connect an oscilloscope to B output of TP2701 A0 board.
3. Adjust RV2704 so that the waveform as shown.



4. Connect an oscilloscope to G output of TP2702 A0 board.
5. Adjust RV2702 so that the waveform as shown.
6. Connect an oscilloscope to R output of TP2703 A0 board.
5. Adjust RV2703 so that the waveform as shown.

#### 4-12. G BOARD ADJUSTMENTS



##### +225 V line adjustment (RV601)

1. Input the color-bar signal.
2. Connect a digital multimeter to emitter of Q604.
3. Adjust RV601 so that voltage is  $+225 \pm 0.5$  V.

##### +115 V line adjustment (RV602)

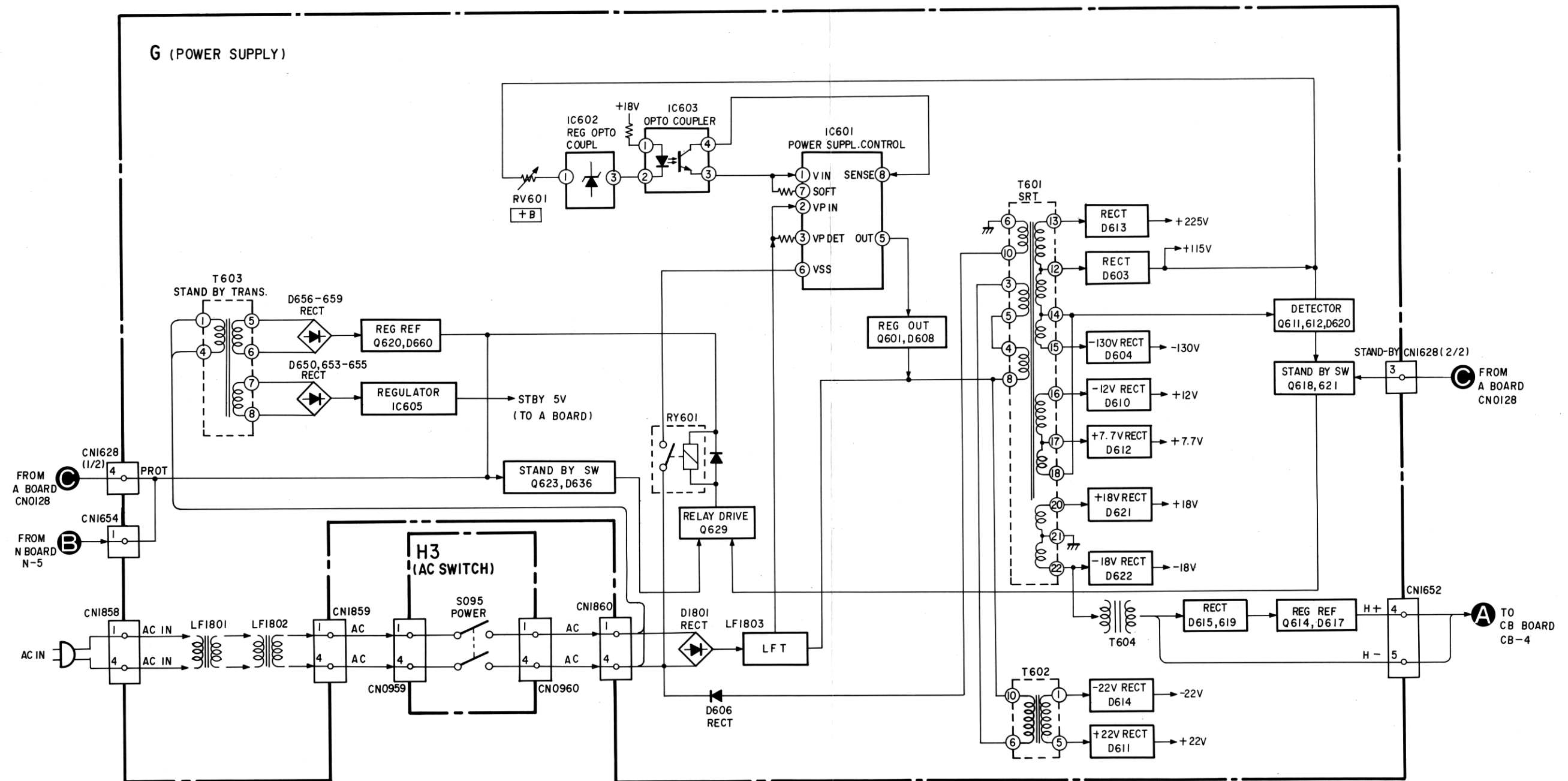
1. Input the color-bar signal.
2. Connect a digital multimeter to emitter of Q601.
3. Adjust RV602 so that voltage is  $+115 \pm 1.0$  V.

##### - 125 V line adjustment (RV603)

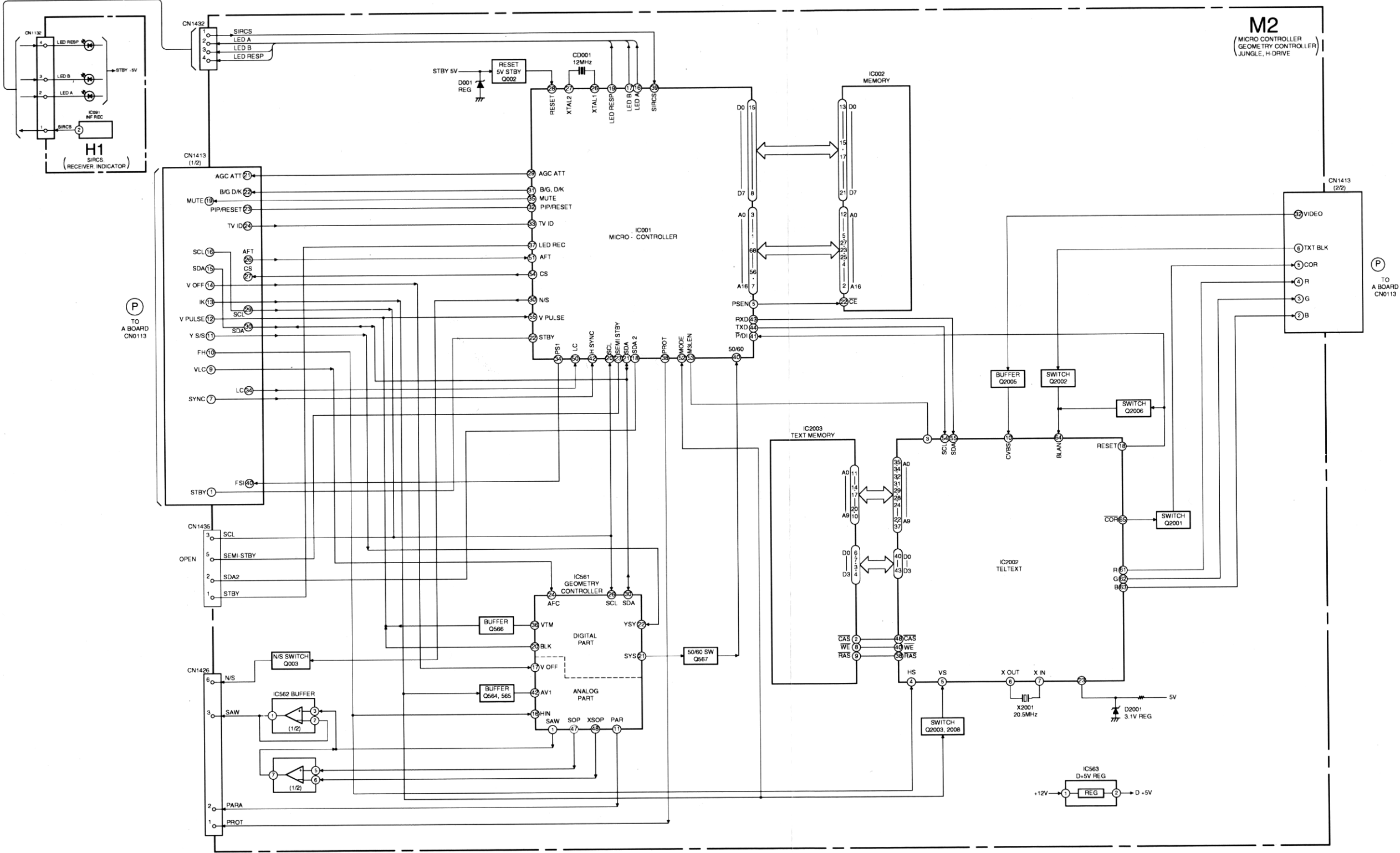
1. Input the color-bar signal.
2. Connect a digital multimeter to emitter of Q612.
3. Adjust RV603 so that voltage is  $-125 \pm 0.1$  V.

# SECTION 5 DIAGRAMS

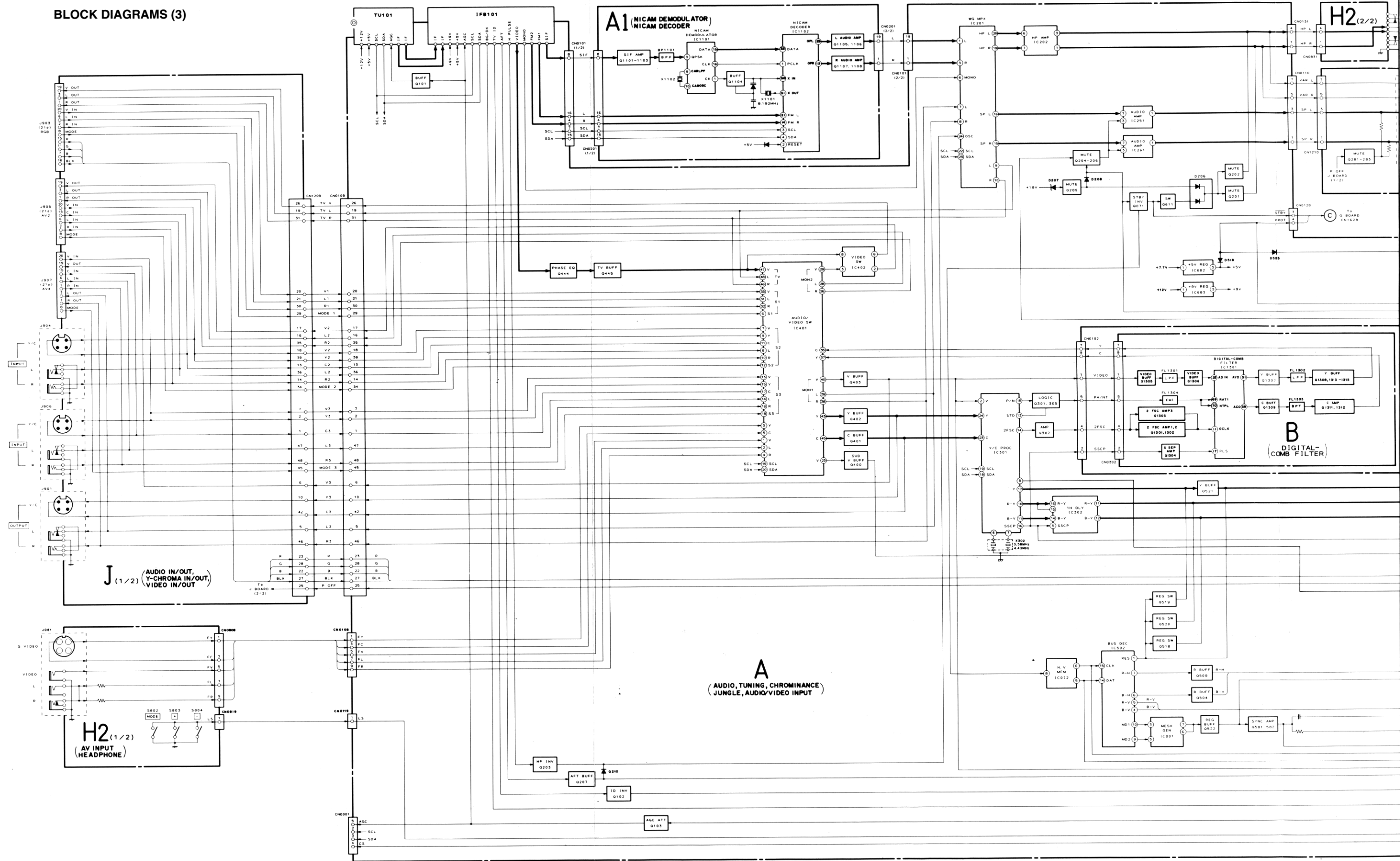
## 5-1. BLOCK DIAGRAMS (1)



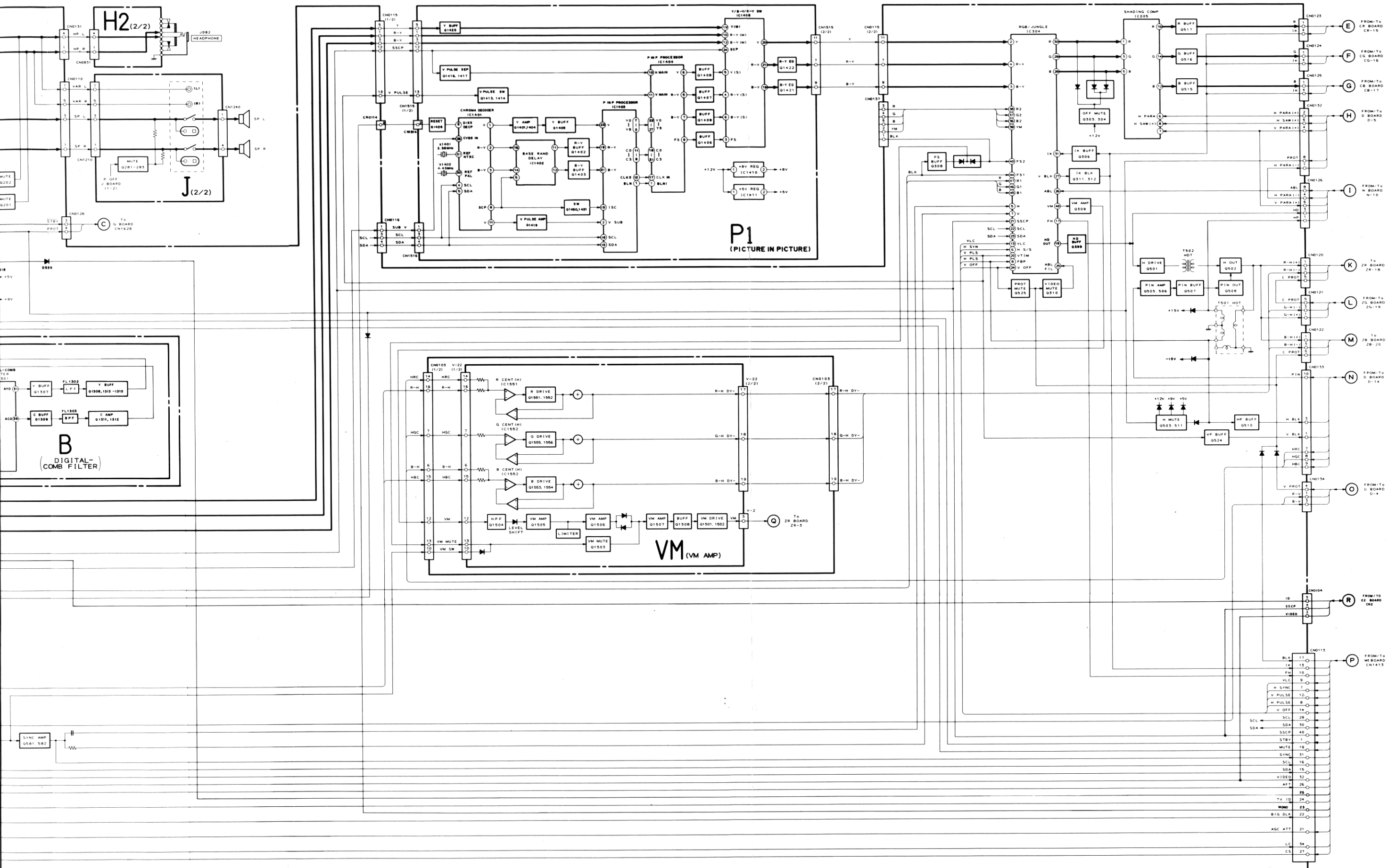
BLOCK DIAGRAMS (2)



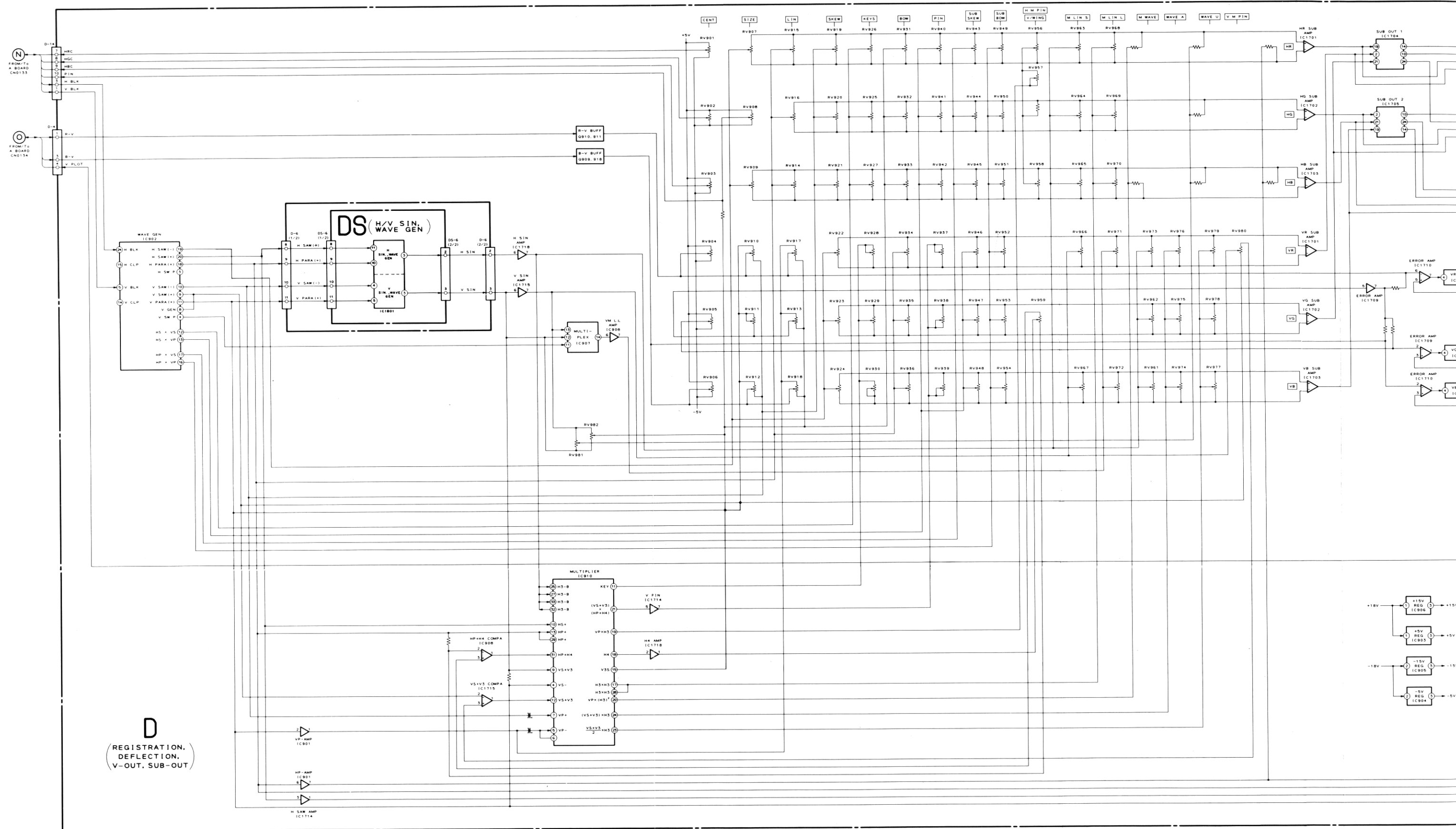
# BLOCK DIAGRAMS (3)





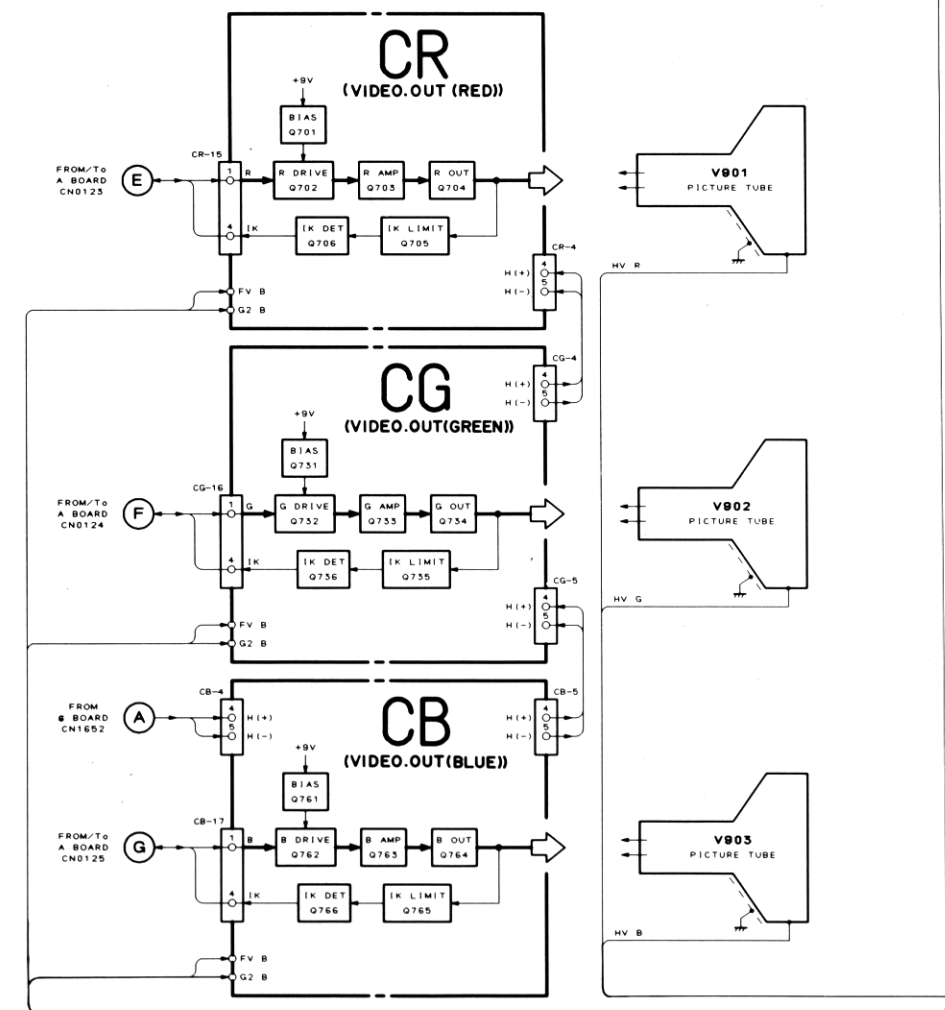
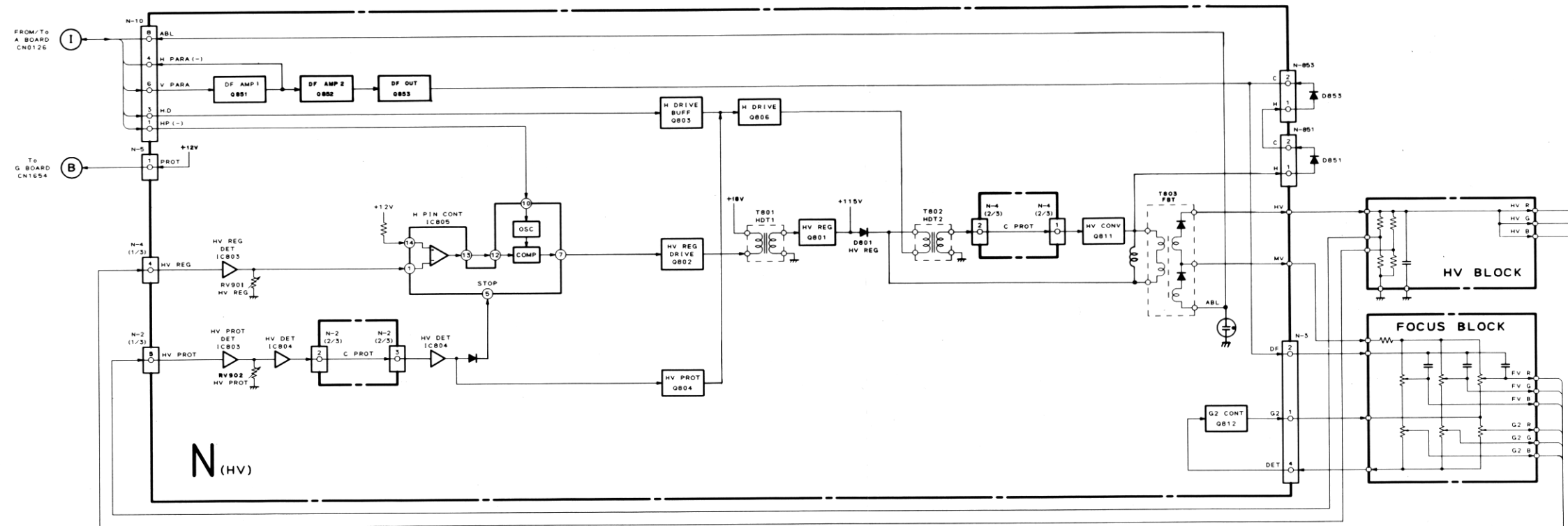


# BLOCK DIAGRAMS (4)



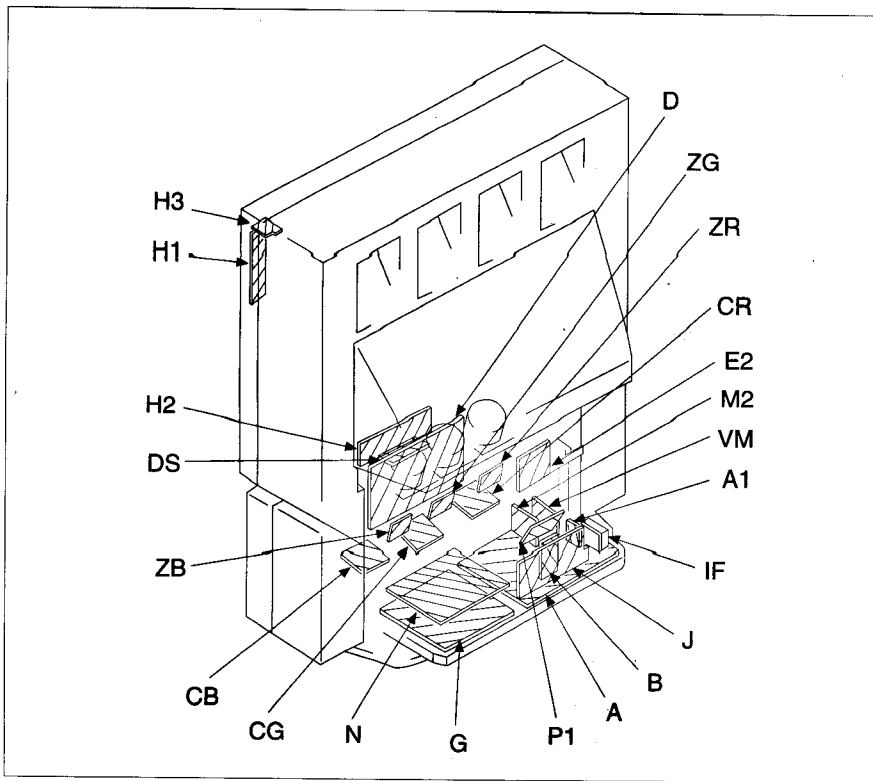


# BLOCK DIAGRAMS (5)





## 5-2. CIRCUIT BOARD LOCATION










## 5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

### Note :


- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF:  $\mu\text{F}$  50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.  
k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.



Pitch : 5 mm  
Rating electrical power  $\frac{1}{4}$  W

-  : nonflammable resistor.
-  : internal component.
-  : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : earth - ground.
-  : earth - chassis.
-  : no mounted.

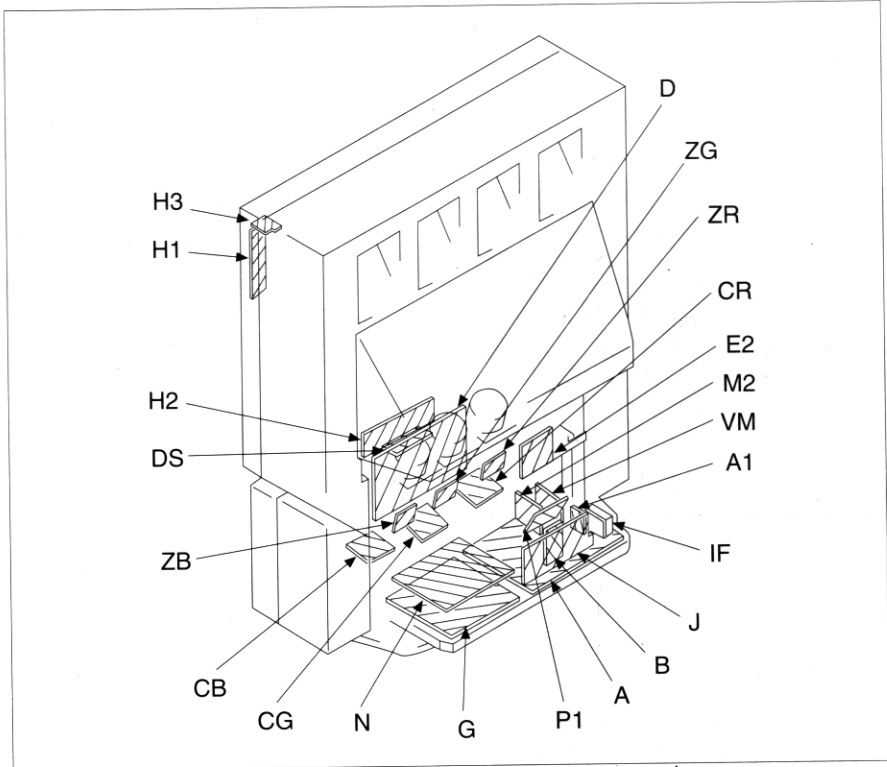
**Note :** The components identified by shading and marked  are critical for safety. Replace only with part number specified.

### Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
COIL	: 	ADJUSTABLE RESISTOR
	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
-  : B+ bus.
-  : signal path. (RF)

5-2. CIRCUIT BOARD LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$  50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.  
 $k = 1000$  ,  $M = 1000K$
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm  
Rating electrical power  $\frac{1}{4}$  W

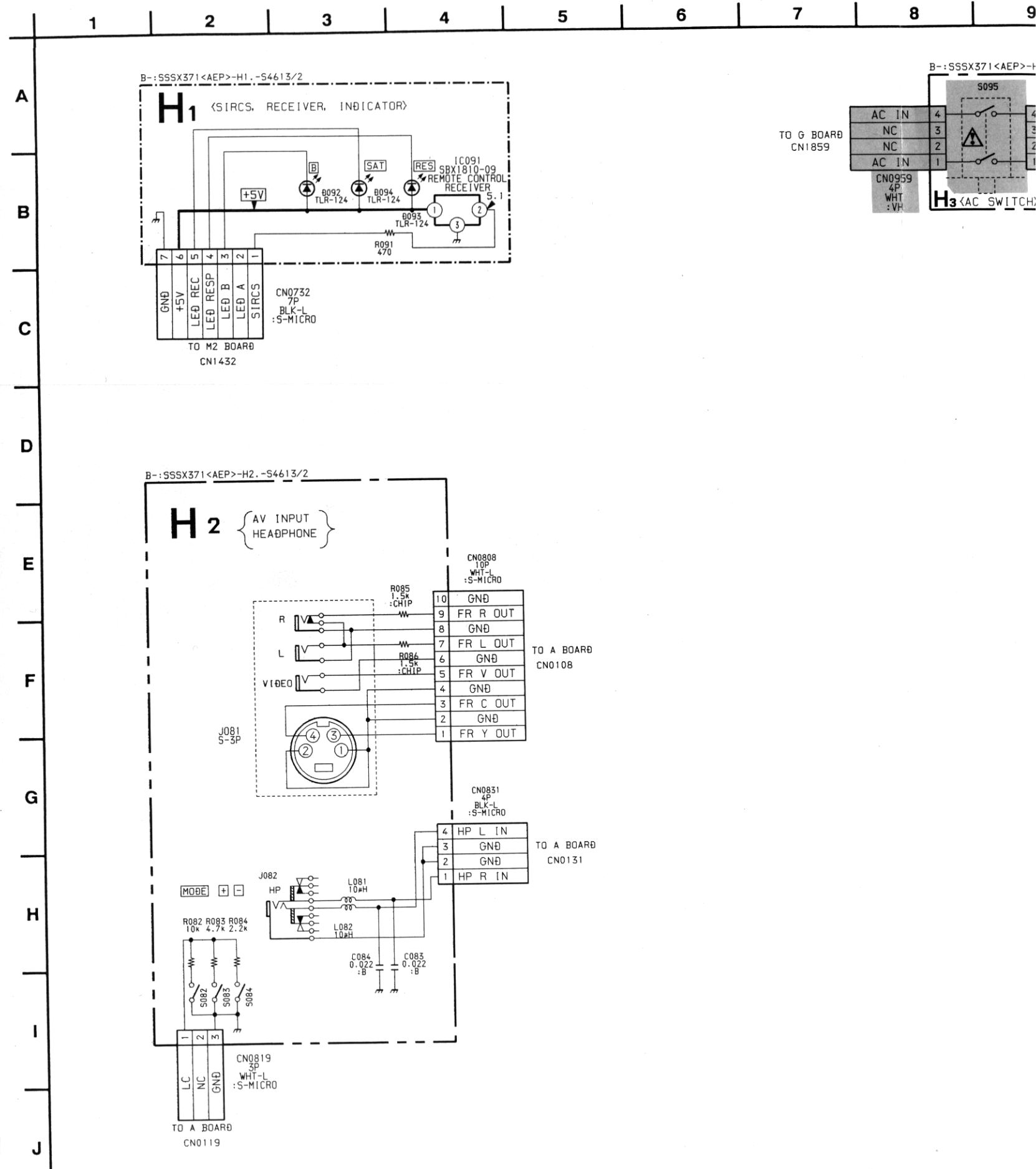
- : nonflammable resistor.
- : internal component.
- : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : earth - ground.
- : earth - chassis.
- : no mounted.

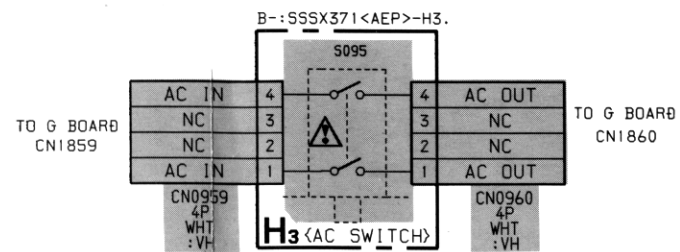
**Note :** The components identified by shading and marked are critical for safety. Replace only with part number specified.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: X	ADJUSTABLE RESISTOR
	: LF-8L	MICRO INDUCTOR
	: TA	TANTALUM
COIL	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE
CAPACITOR		

- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- : B+ bus.
- : signal path. (RF)





**H1**

[ SIRCS, RECEIVER, INDICATOR ]

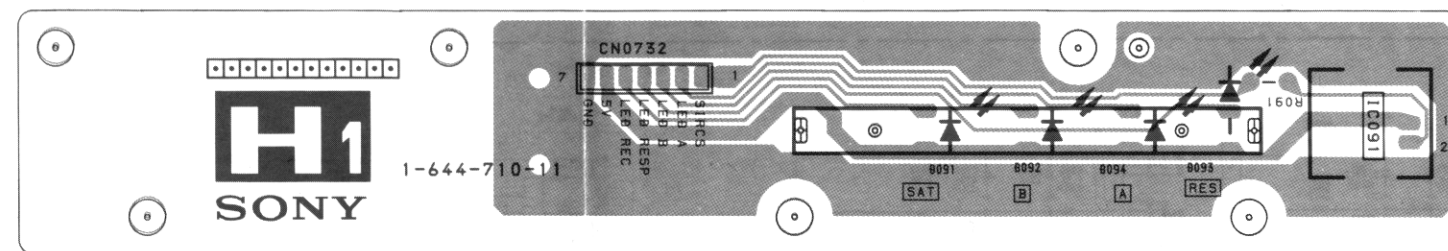
**H2**

[ AV INPUT HEADPHONE ]

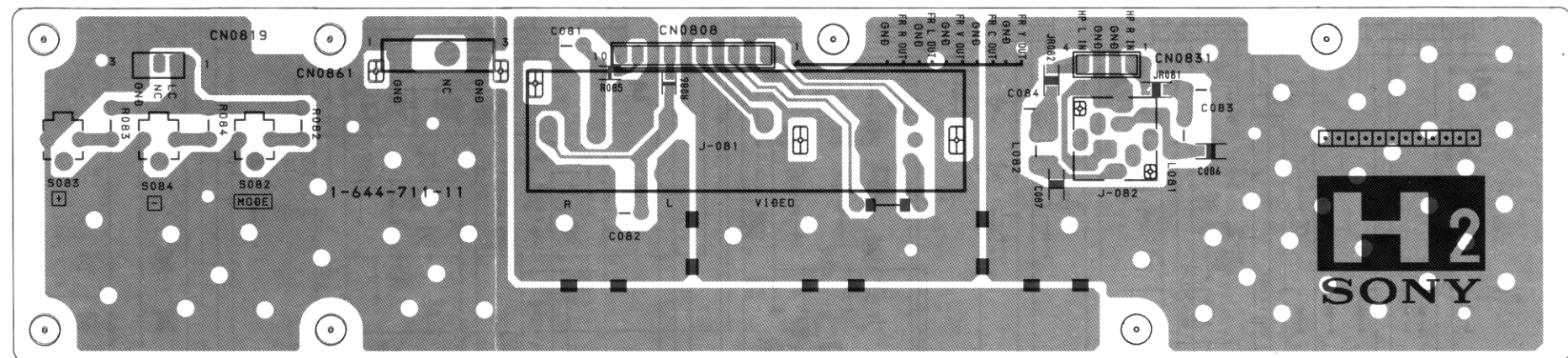
**H3**

[ AC SWITCH ]

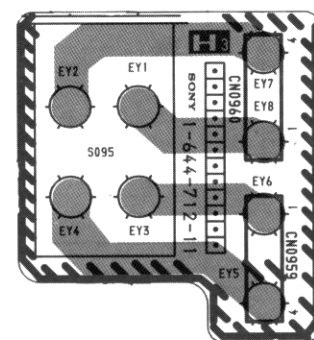
— H1 BOARD —



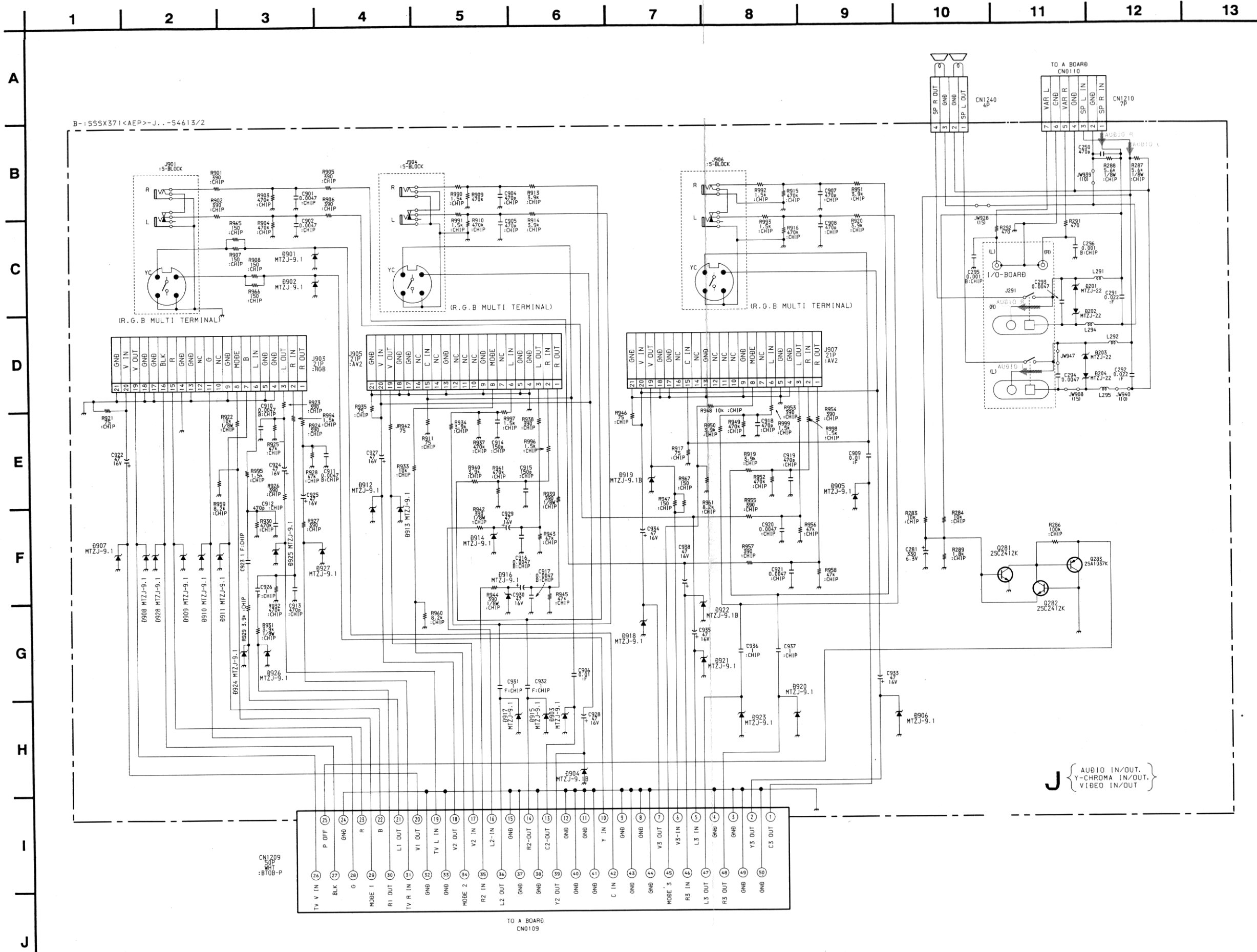
— H2 BOARD —

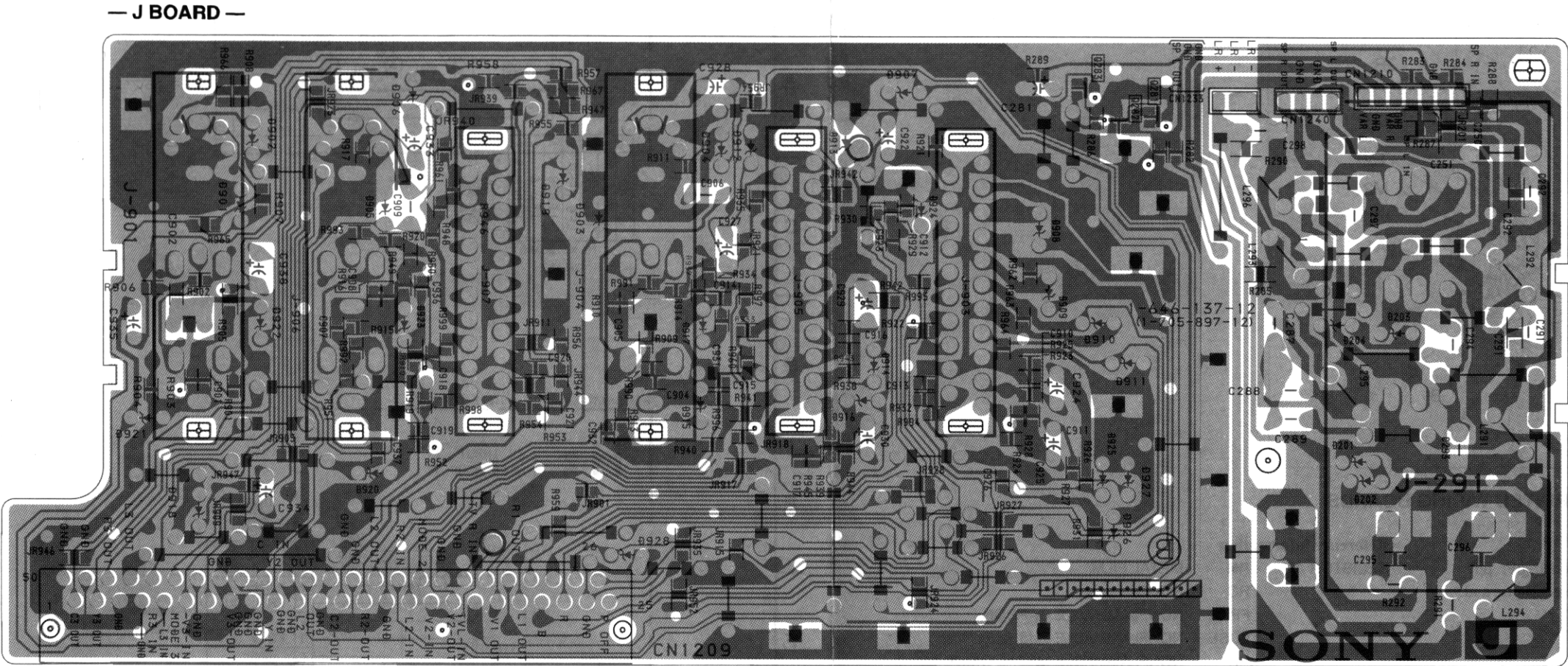


— H3 BOARD —

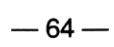


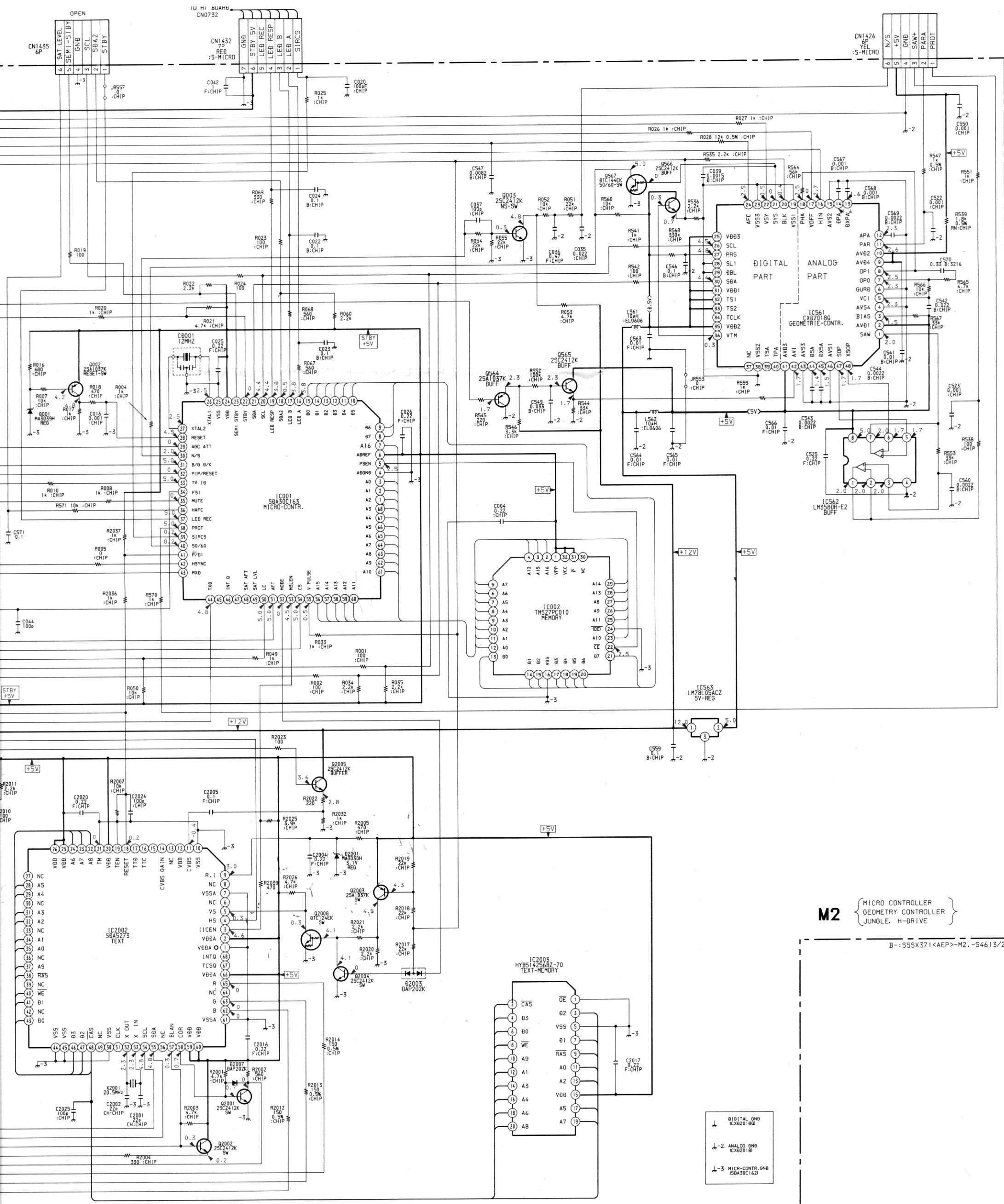






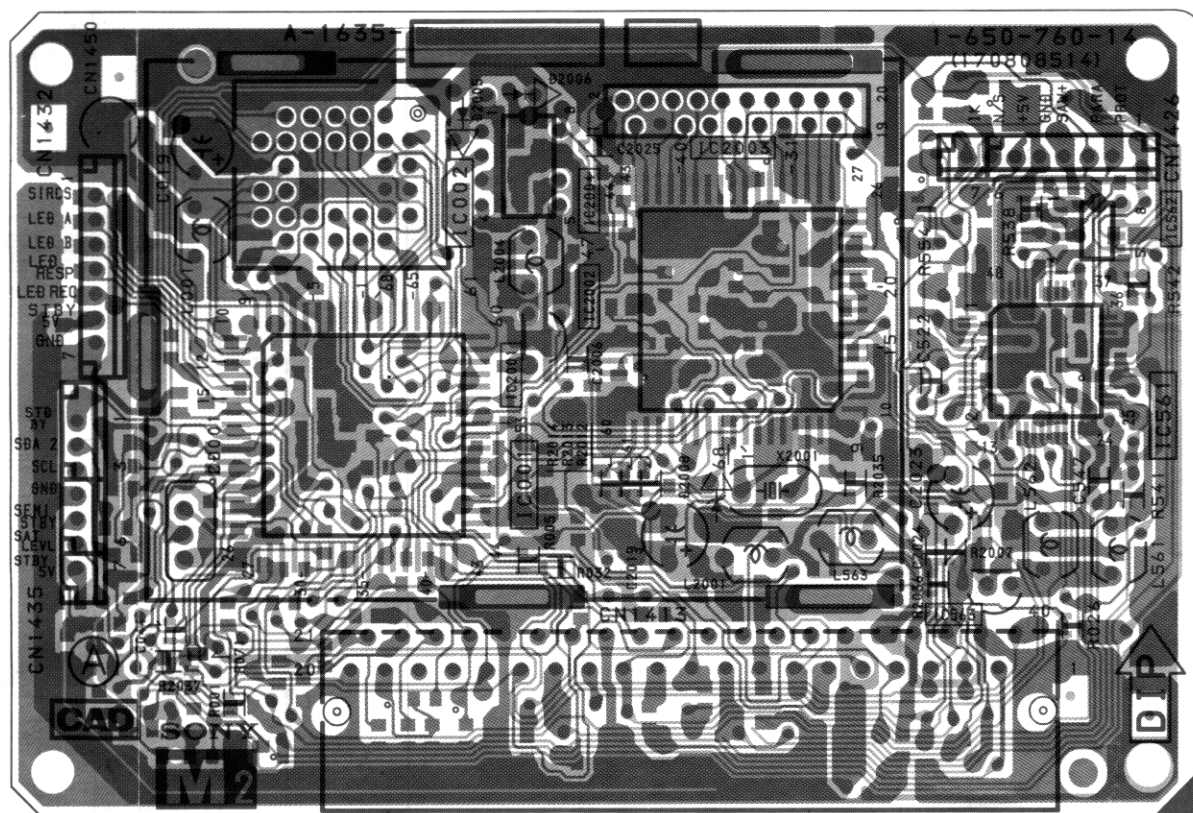
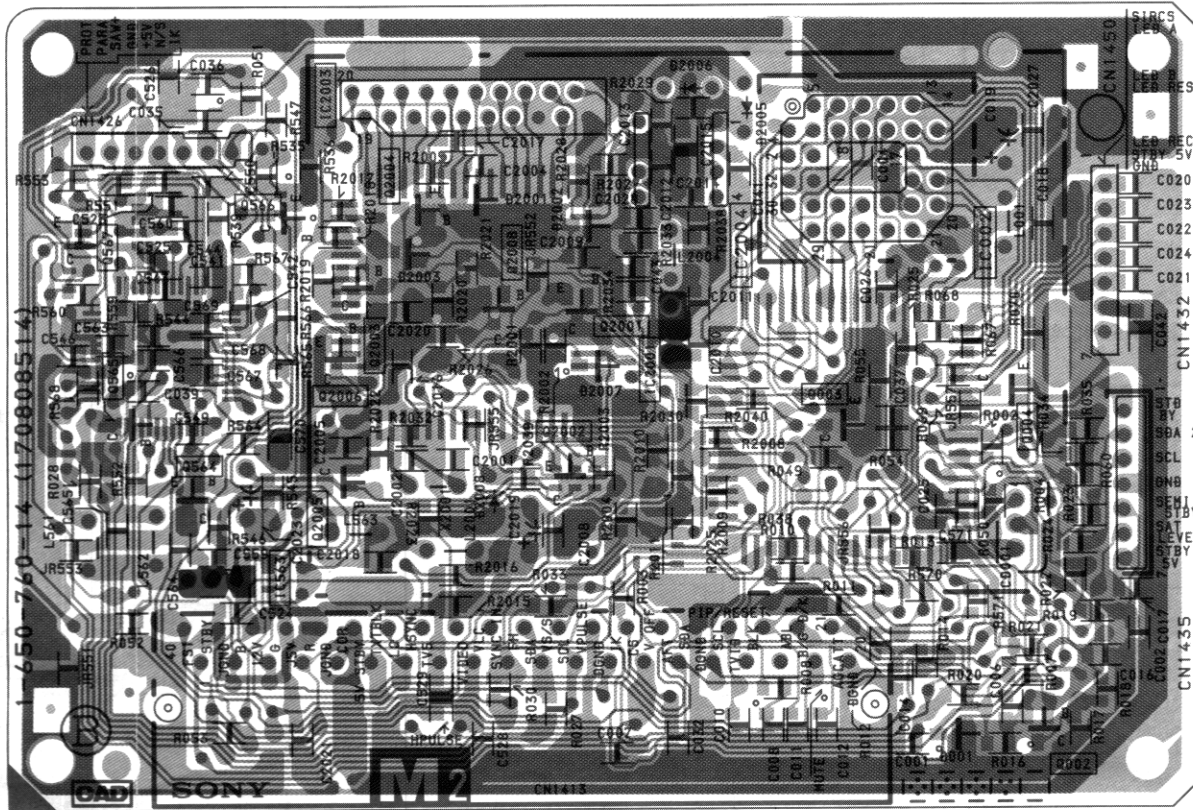
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.





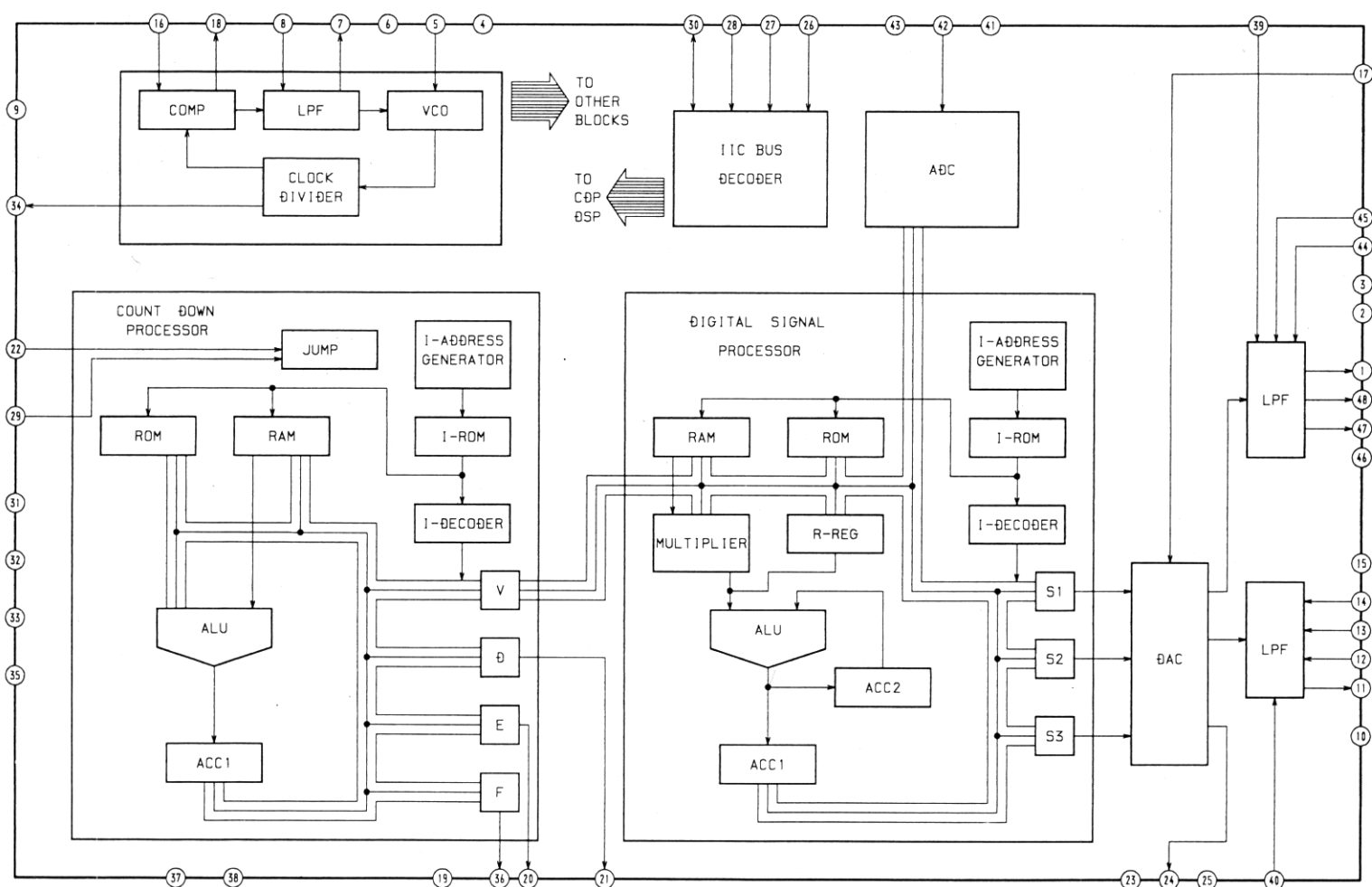


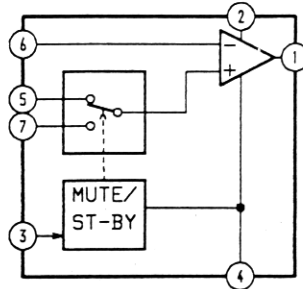
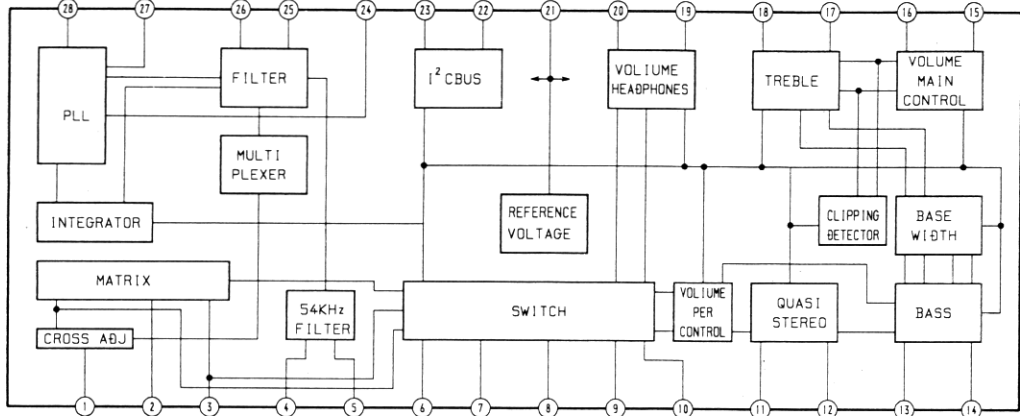
— M2 BOARD —



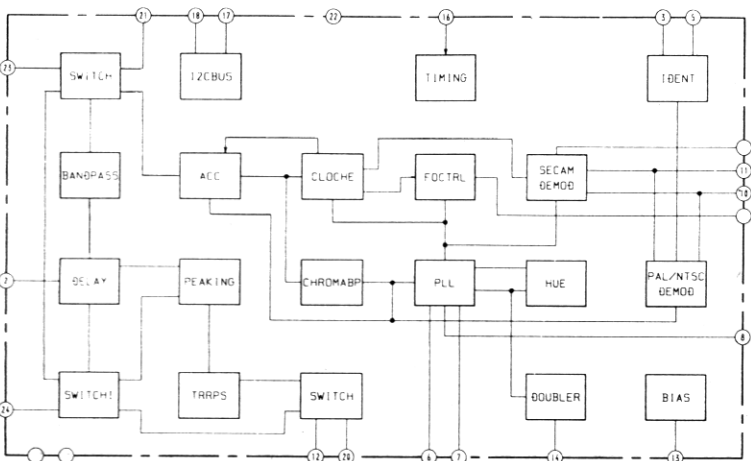
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

M2 BOARD IC561 CXD2018Q

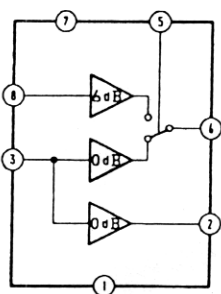




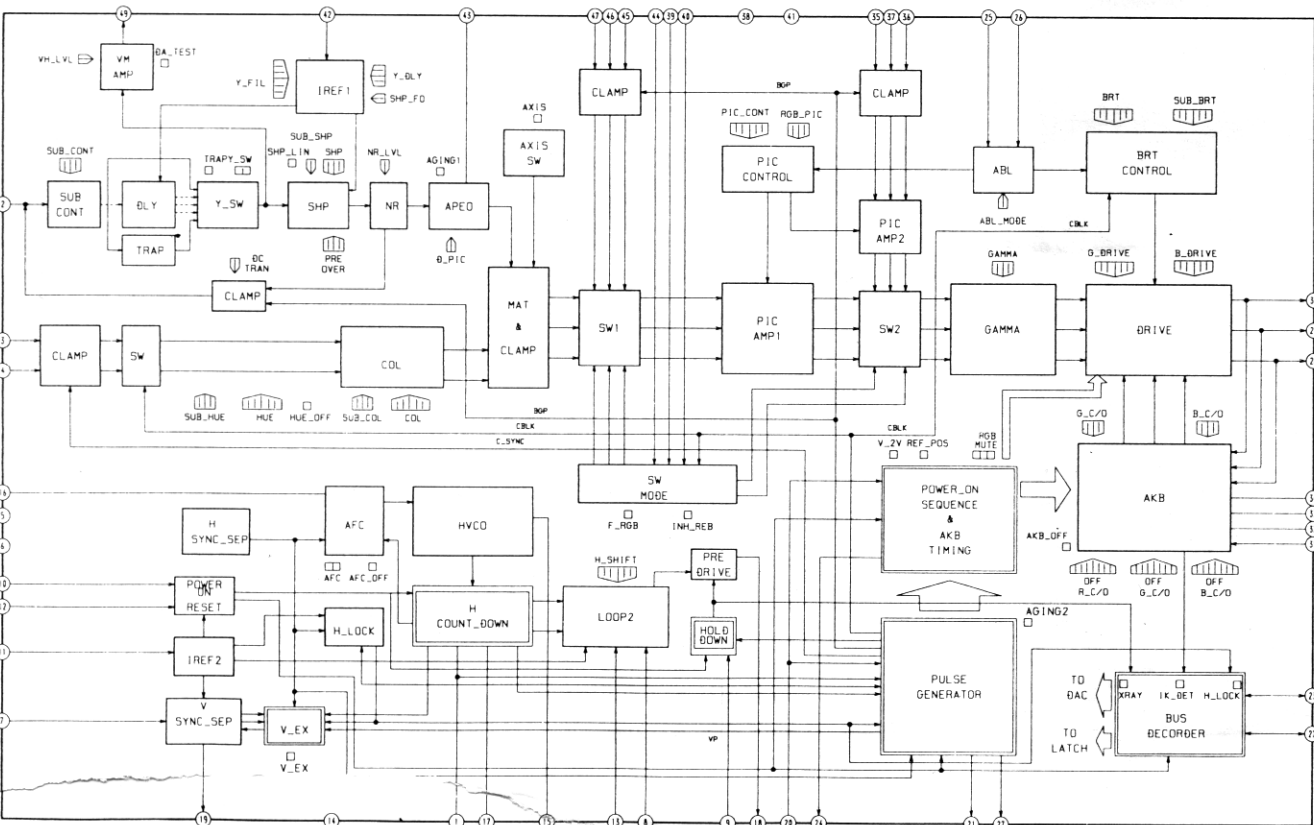
**A BOARD IC301 TDA9145/N2B**



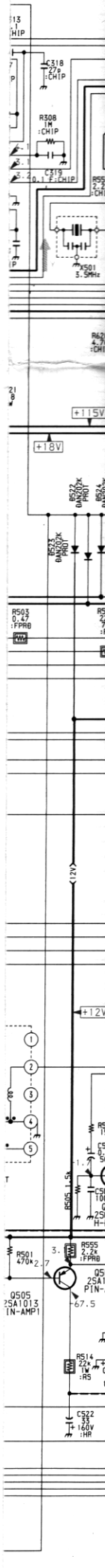
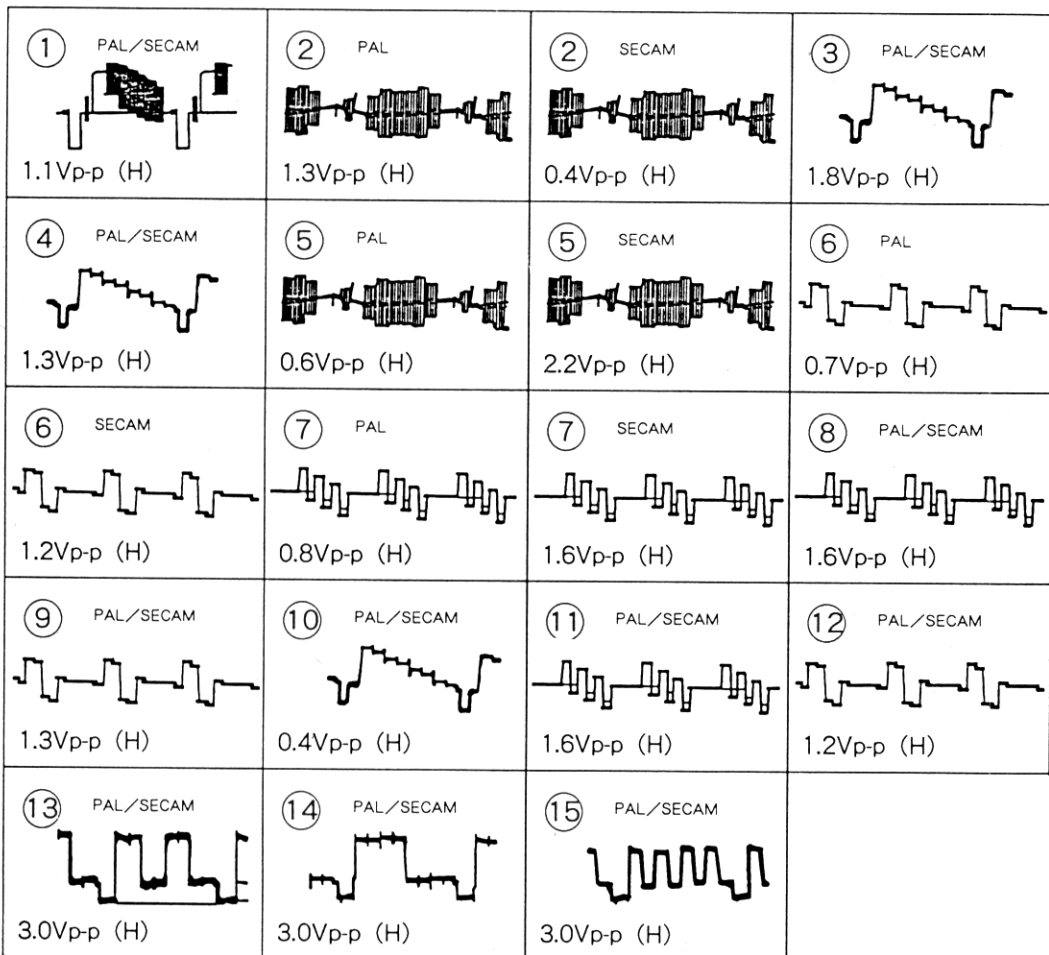
**A BOARD IC402 TEA2114**

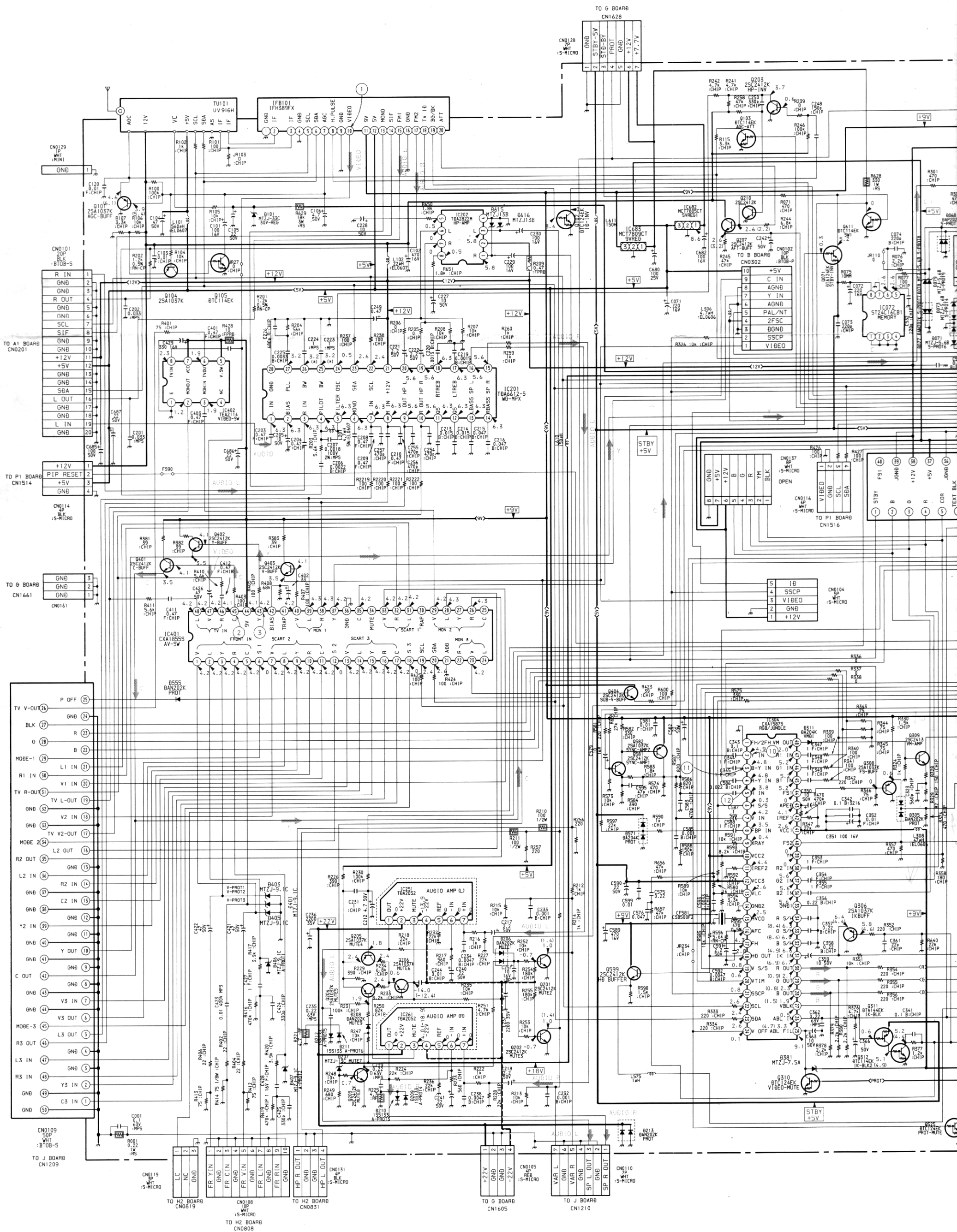


**A BOARD IC304 CXA1587S**

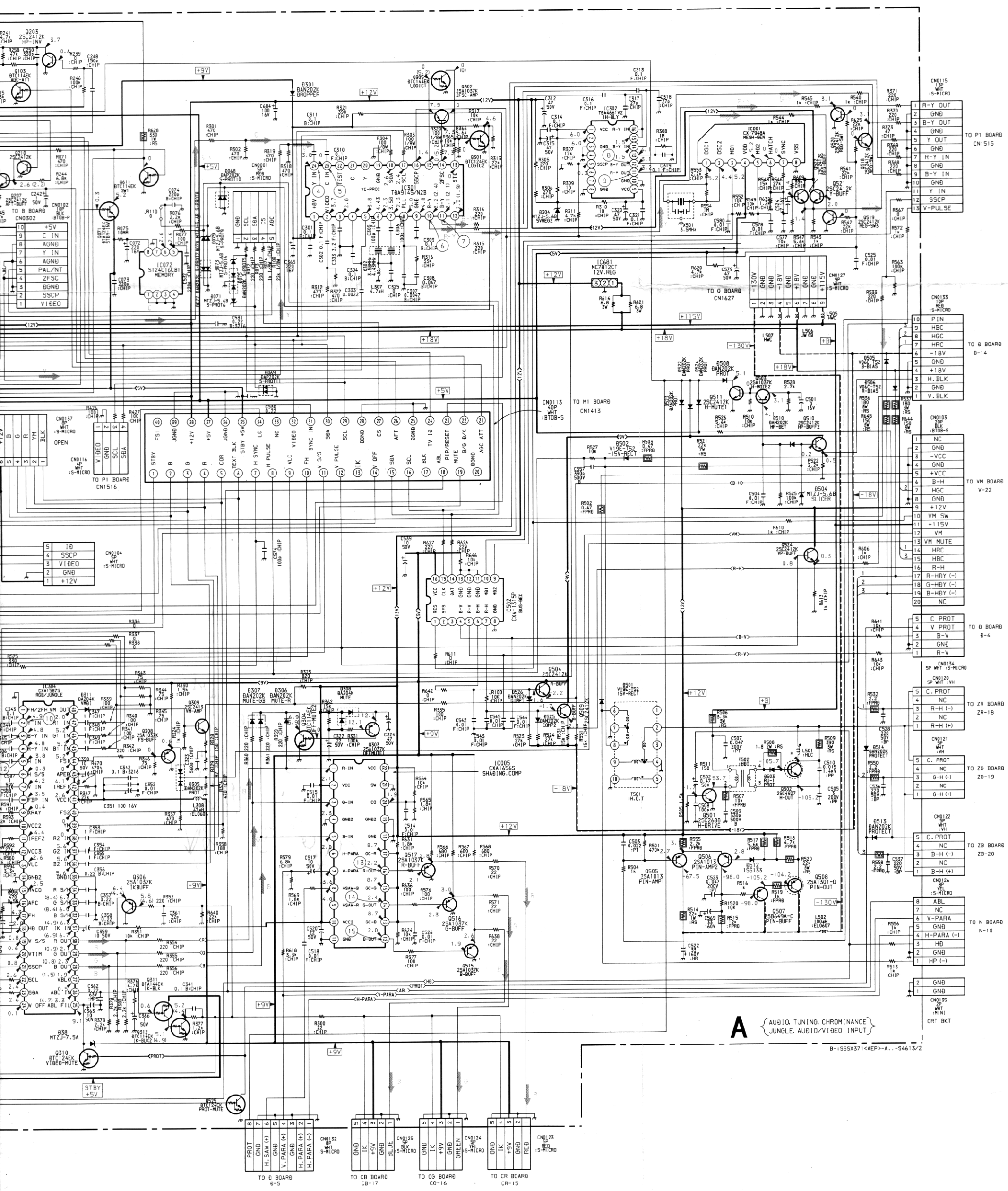


**WAVEFORMS A BOARD**







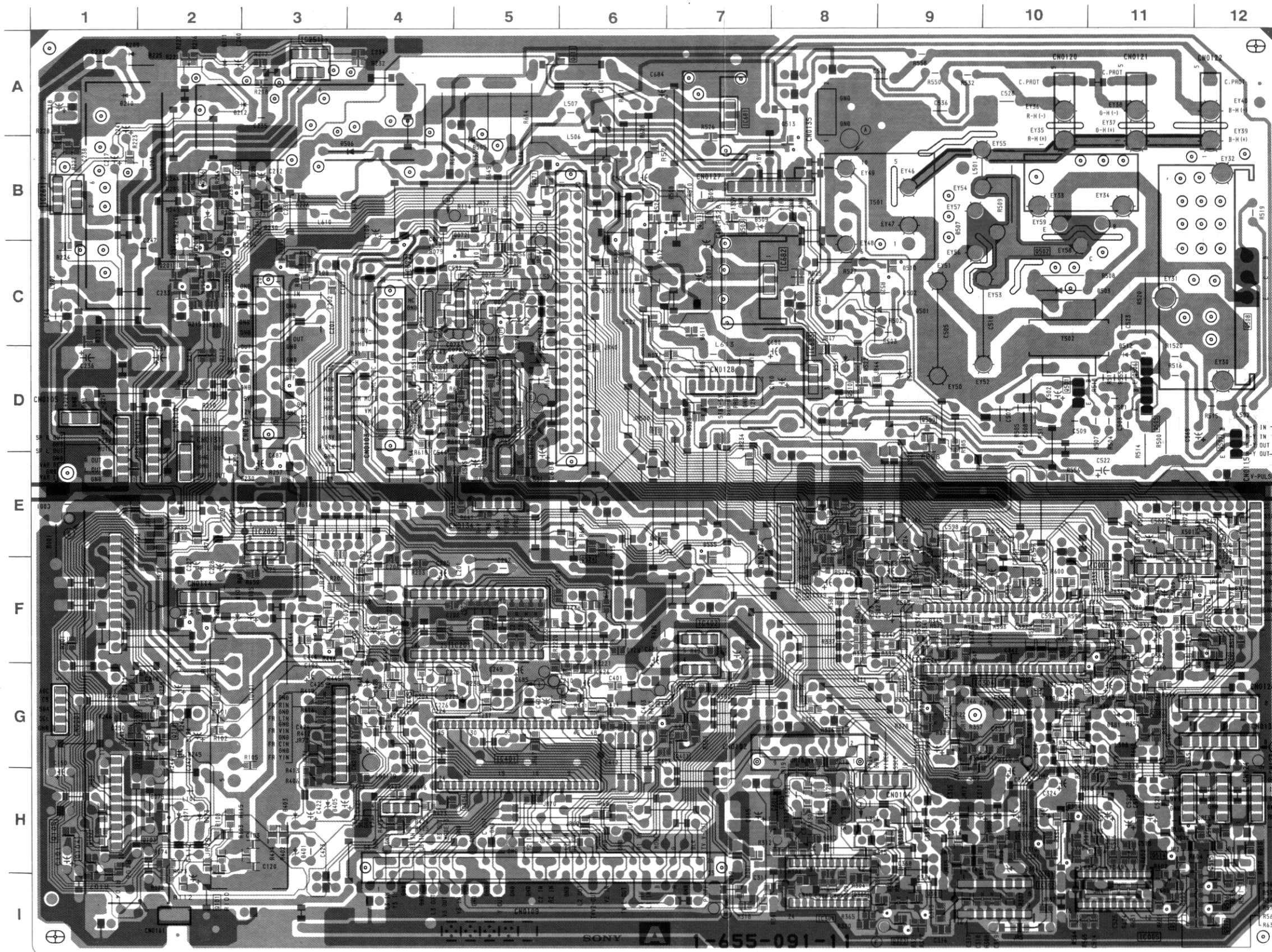


A {AUDIO, TUNING, CHROMINANCE} JUNGLE, AUDIO/VIDEO INPUT

B--SSSX371<AEP>A...-S4613/2



— A BOARD —

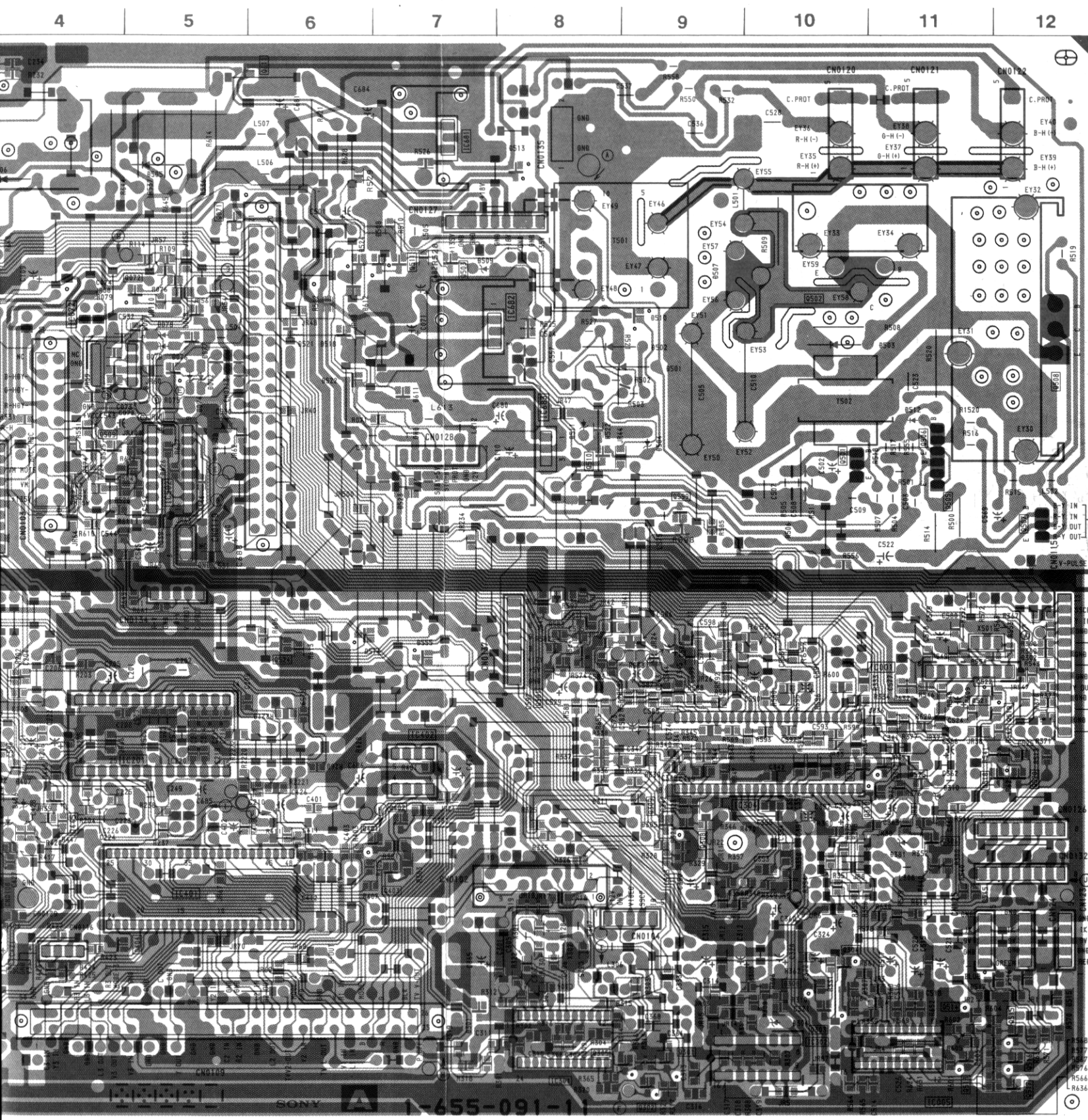


— A BOARD —

IC	
IC001	F-11
IC005	I-11
IC072	C-4
IC201	F-5
IC202	E-3
IC251	A-3
IC261	B-1
IC301	I-8
IC302	I-10
IC304	G-10
IC401	G-5
IC402	F-7
IC502	D-5
IC681	A-7
IC682	C-8
IC683	D-8
TRANSISTOR	
Q071	B-5
Q101	I-2
Q102	H-1
Q103	H-2
Q104	H-1
Q105	H-1
Q201	C-2
Q202	C-2
Q203	G-2
Q204	B-3
Q205	B-2
Q206	B-2
Q207	G-2
Q209	C-2
Q210	G-2
Q301	I-9
Q302	I-9
Q303	H-10
Q304	H-10
Q305	I-9
Q306	G-11
Q308	G-9
Q309	G-9
Q310	G-11

• : Pattern from the side which enables  
• : Pattern of the rear side.





— A BOARD —

IC		Q311 F-10		D208 B-2	
IC001	F-11	Q312	F-11	D209	A-1
IC005	I-11	Q401	G-7	D210	A-1
IC072	C-4	Q402	G-7	D211	A-2
IC201	F-5	Q403	G-7	D212	A-2
IC202	E-3	Q404	H-4	D213	C-1
IC251	A-3	Q501	D-10	D301	H-7
IC261	B-1	Q502	C-10	D304	H-10
IC301	I-8	Q503	B-7	D305	G-9
IC302	I-10	Q504	D-4	D306	H-10
IC304	G-10	Q505	D-11	D307	H-10
IC401	G-5	Q506	D-11	D308	H-10
IC402	F-7	Q507	D-12	D311	G-8
IC502	D-5	Q508	C-12	D381	G-11
IC681	A-7	Q509	D-4	D401	H-3
IC682	C-8	Q510	D-8	D403	H-3
IC683	D-8	Q511	B-7	D405	H-3
TRANSISTOR		Q515	I-12	D406	G-4
Q071	B-5	Q516	I-12	D407	G-4
Q101	I-2	Q517	I-12	D501	C-9
Q102	H-1	Q518	F-12	D502	C-9
Q103	H-2	Q519	F-12	D503	C-10
Q104	H-1	Q520	F-12	D504	D-9
Q105	H-1	Q521	F-12	D505	B-5
Q201	C-2	Q522	F-12	D506	B-3
Q202	C-2	Q524	F-6	D508	B-7
Q203	G-2	Q525	F-11	D510	C-9
Q204	B-3	Q581	F-8	D512	D-11
Q205	B-2	Q582	E-8	D513	A-8
Q206	B-2	Q599	D-9	D514	E-6
Q207	G-2	Q611	A-6	D522	C-6
Q209	C-2	DIODE		D523	D-7
Q210	G-2	D068	C-5	D524	B-6
Q301	I-9	D069	G-2	D525	D-4
Q302	I-9	D071	H-2	D526	D-4
Q303	H-10	D073	H-2	D555	E-7
Q304	H-10	D075	H-2	D571	E-9
Q305	I-9	D077	C-5	D615	E-2
Q306	G-11	D078	C-5	D616	E-3
Q308	G-9	D079	C-5		
Q309	G-9	D101	F-2		
Q310	G-11	D206	C-2		
		D207	B-2		

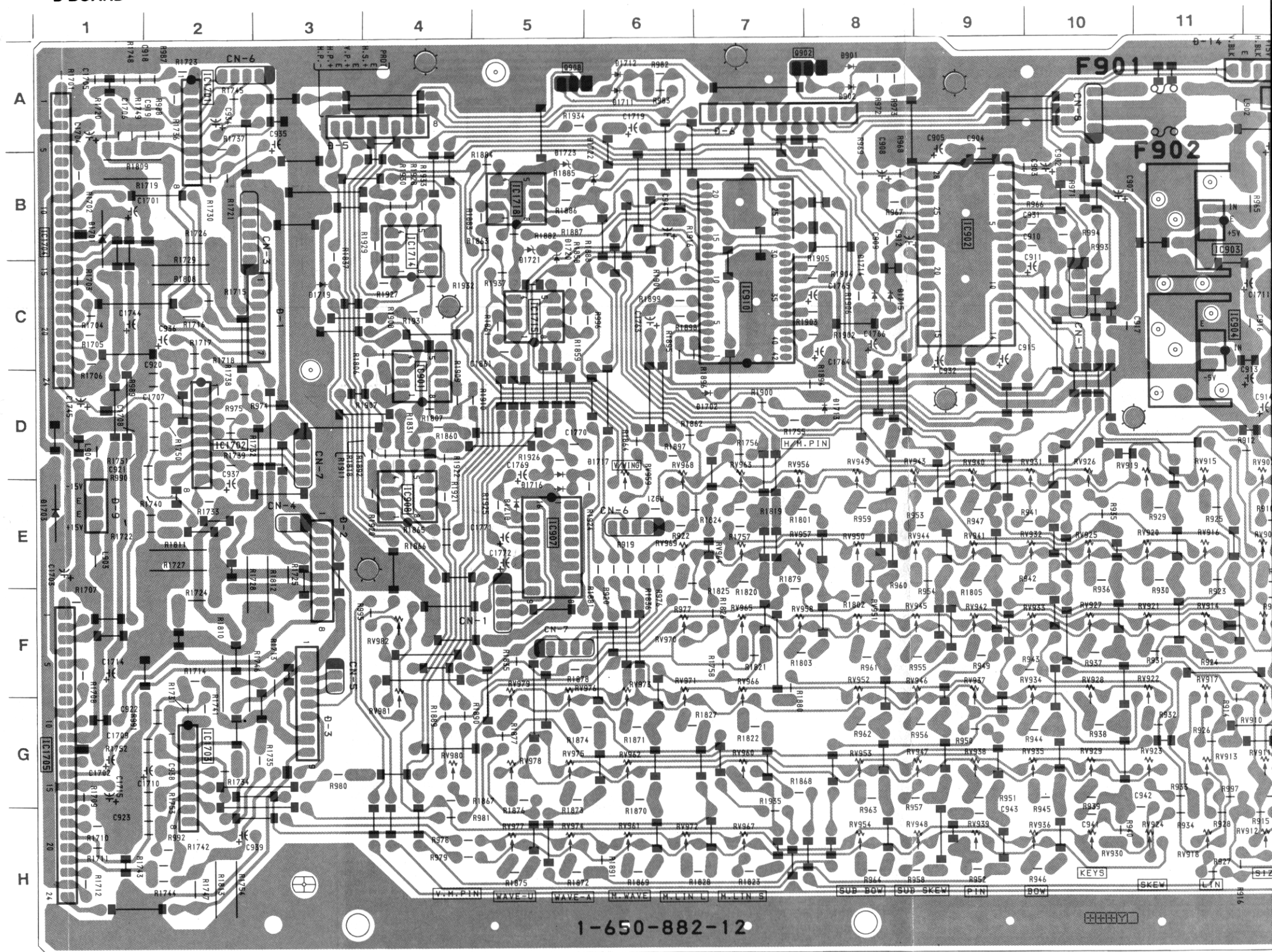
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.



— D BOARD —

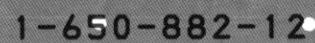
IC		D1712 A-6		RV934 F-10	
IC901	D-4	D1713	D-8	RV935	G-10
IC902	B-9	D1714	C-8	RV936	H-10
IC903	B-11	D1715	C-8	RV937	F-9
IC904	C-11	D1716	E-5	RV938	G-9
IC905	C-12	D1717	D-5	RV939	H-9
IC906	B-12	D1718	E-5	RV940	D-9
IC907	E-5	D1720	B-5	RV941	E-9
IC908	E-4	D1721	B-5	RV942	F-9
IC910	C-7	D1722	B-6	RV943	D-9
IC1701	A-2	D1723	B-5	RV944	E-9
IC1702	D-2	VARIABLE RESISTOR		RV945	F-9
IC1703	G-2			RV946	F-9
IC1704	B-2	RV901	D-12	RV947	G-9
IC1705	G-1	RV902	E-12	RV948	H-9
IC1706	C-14	RV903	F-12	RV949	D-8
IC1707	E-14	RV904	F-12	RV950	E-8
IC1708	H-14	RV905	G-12	RV951	F-8
IC1709	F-15	RV906	H-12	RV952	F-8
IC1710	D-15	RV907	D-12	RV953	G-8
IC1714	B-4	RV908	E-12	RV954	H-8
IC1715	C-5	RV909	F-12	RV955	D-7
IC1718	B-5	RV910	G-12	RV956	D-7
TRANSISTOR		RV911	G-12	RV957	E-7
		RV912	H-12	RV958	F-7
Q902	A-7	RV913	G-11	RV959	D-6
Q906	B-13	RV914	F-11	RV961	H-6
Q907	B-13	RV915	D-11	RV962	G-6
Q908	A-5	RV916	E-11	RV963	D-7
Q909	C-13	RV917	F-12	RV964	E-7
Q910	B-15	RV918	H-11	RV965	F-7
Q911	C-15	RV919	D-11	RV966	F-7
Q912	C-14	RV920	E-11	RV967	H-7
DIODE		RV921	F-11	RV968	D-6
		RV922	F-11	RV969	E-6
D901	A-8	RV923	G-11	RV970	F-6
D902	A-8	RV924	H-11	RV971	F-6
D1702	D-7	RV925	E-10	RV972	H-6
D1704	C-14	RV926	D-10	RV973	F-6
D1705	F-14	RV927	F-10	RV974	H-5
D1706	H-14	RV928	F-10	RV975	G-5
D1707	A-13	RV929	G-10	RV976	F-5
D1708	A-13	RV930	H-10	RV977	H-5
D1709	G-13	RV931	D-10	RV978	G-5
D1710	D-14	RV932	E-10	RV979	F-5
D1711	A-6	RV933	F-10	RV980	G-4
				RV981	G-4
				RV982	F-4

— D BOARD —

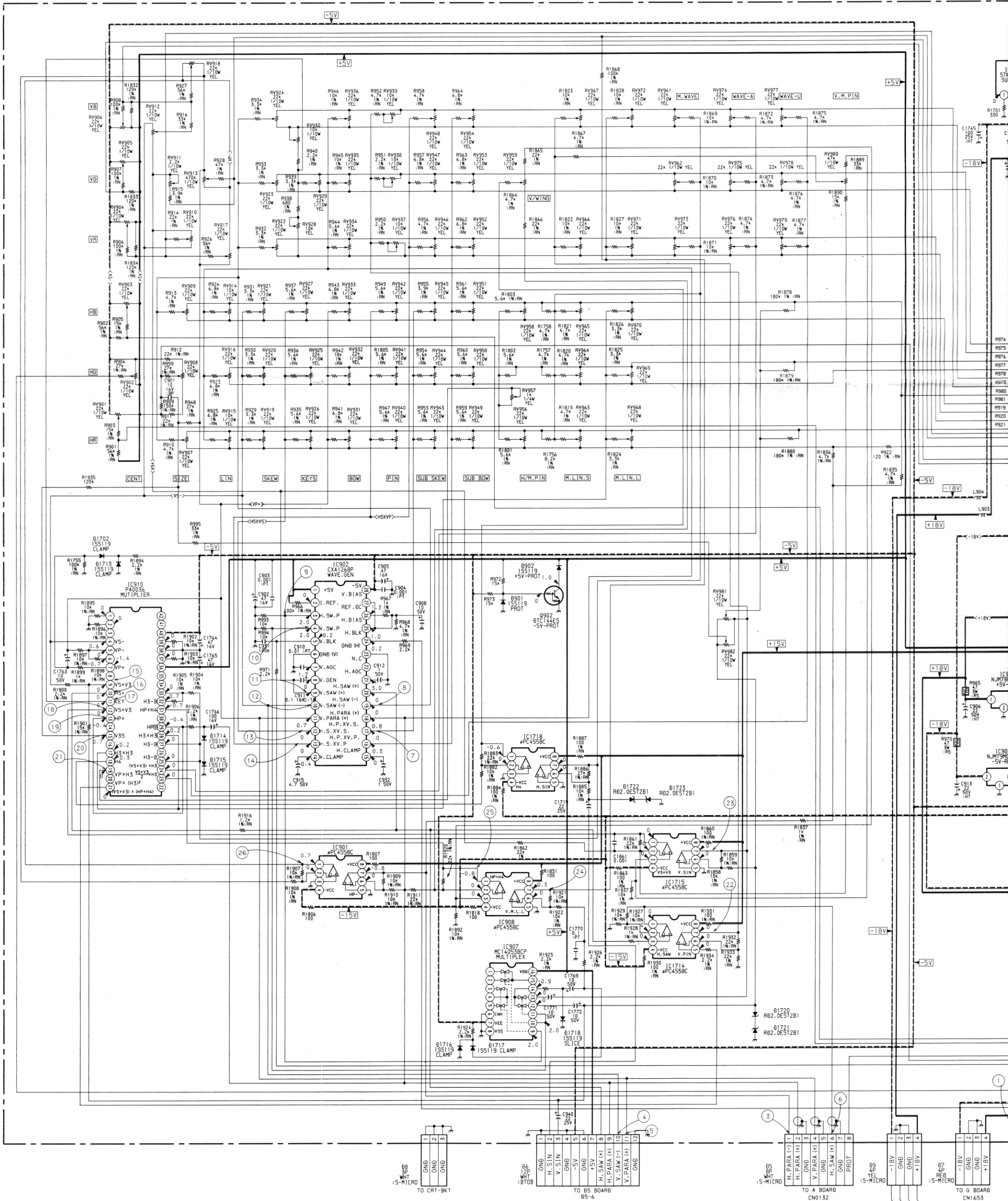


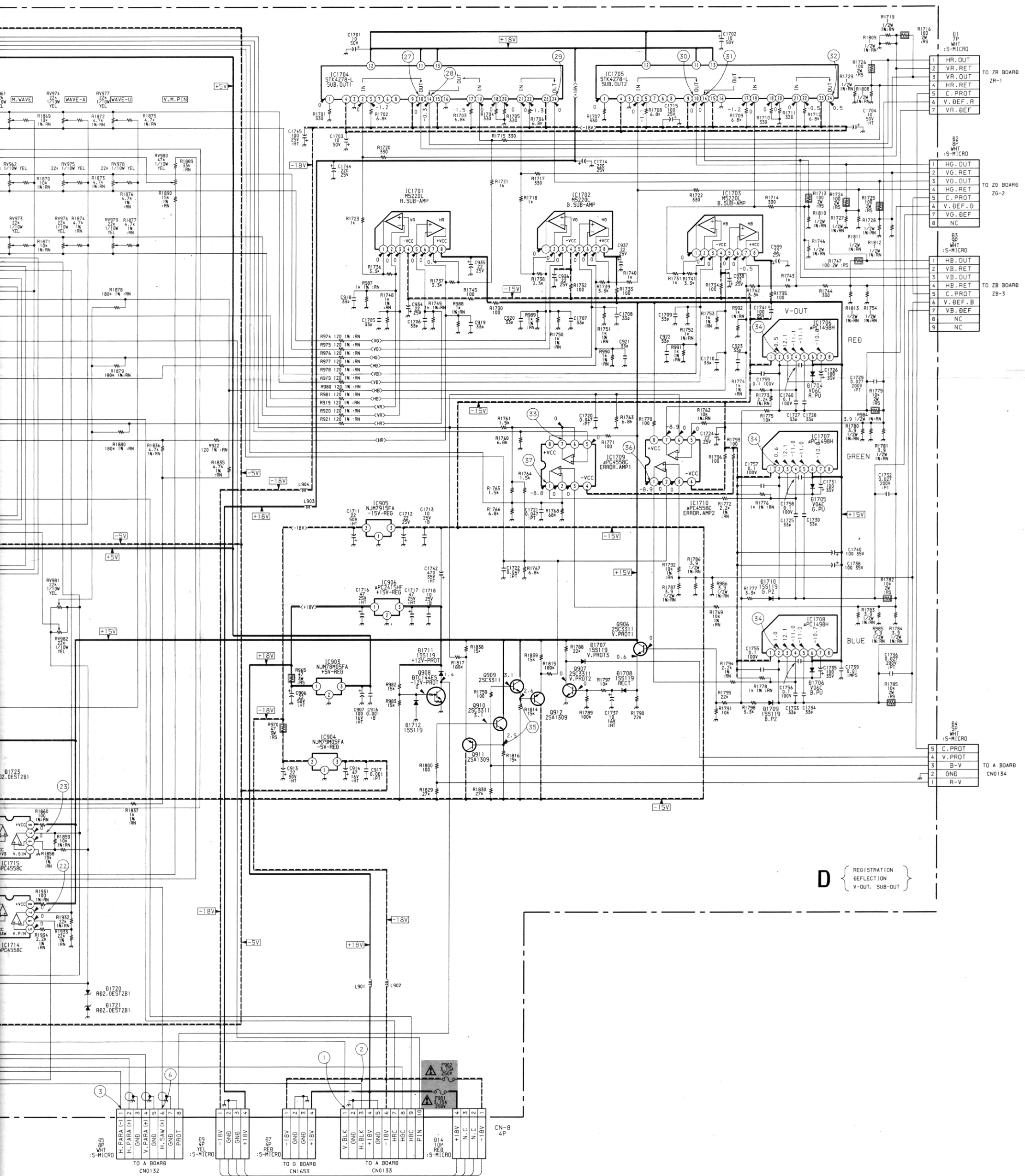


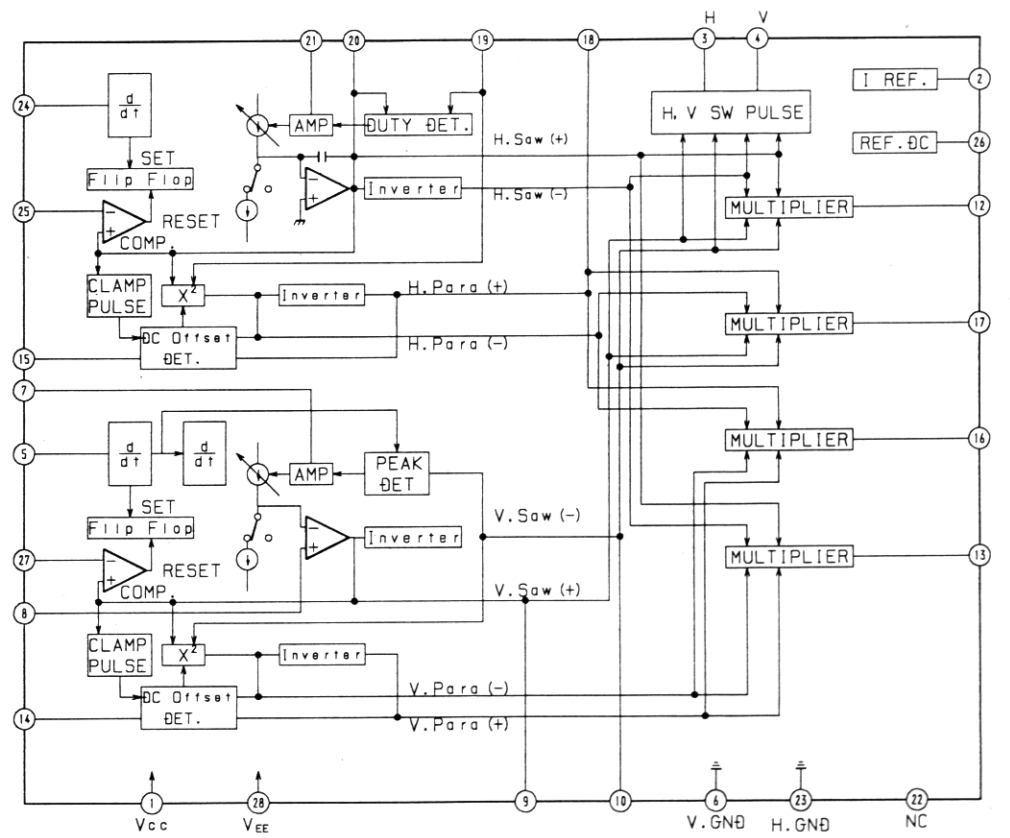
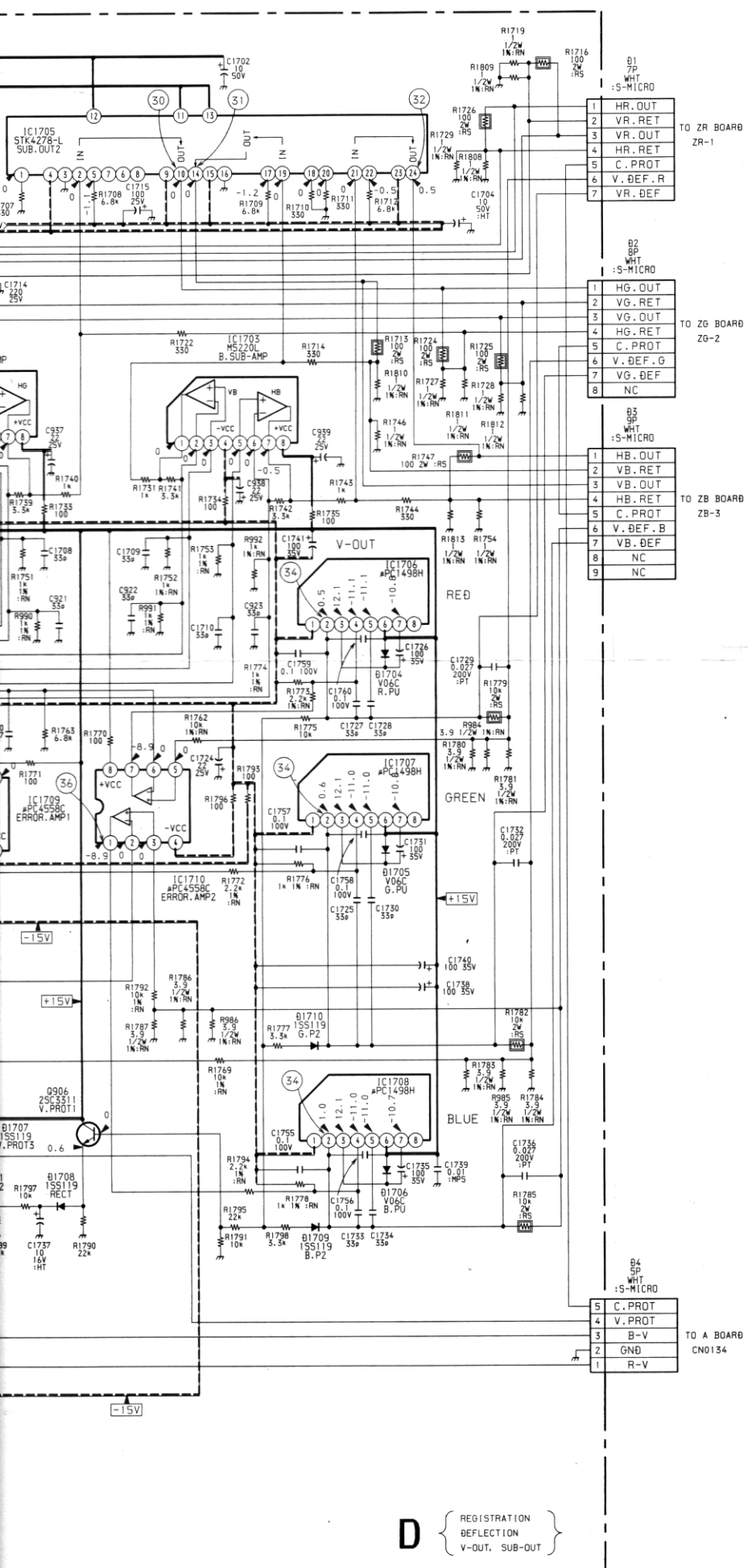
— D BOARD —



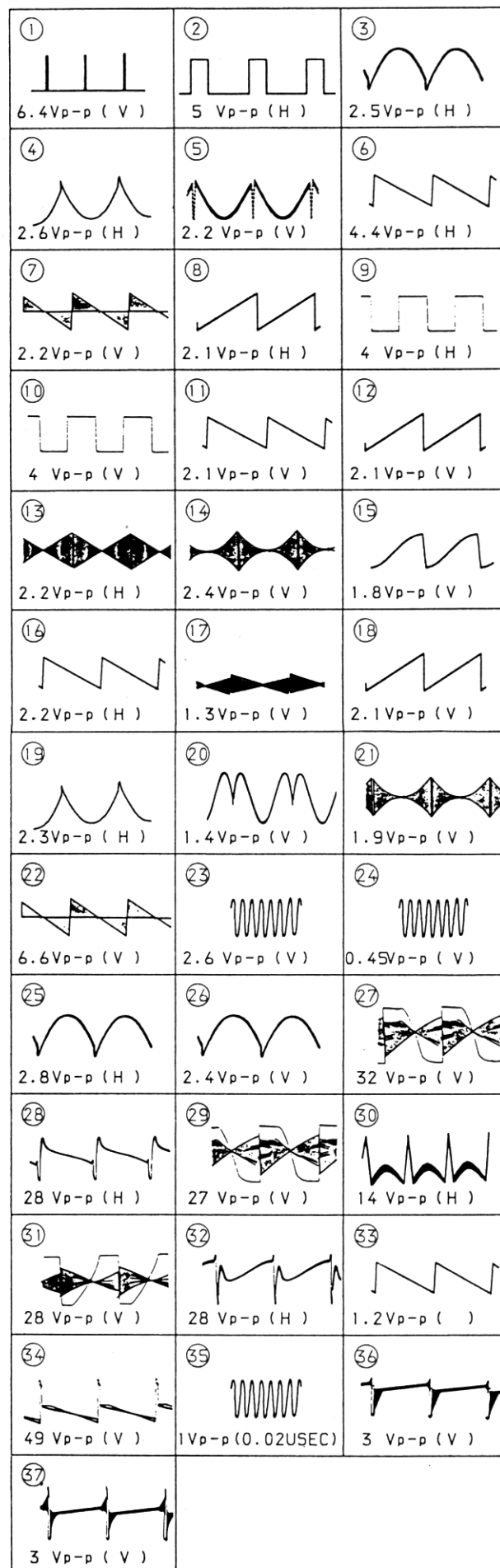






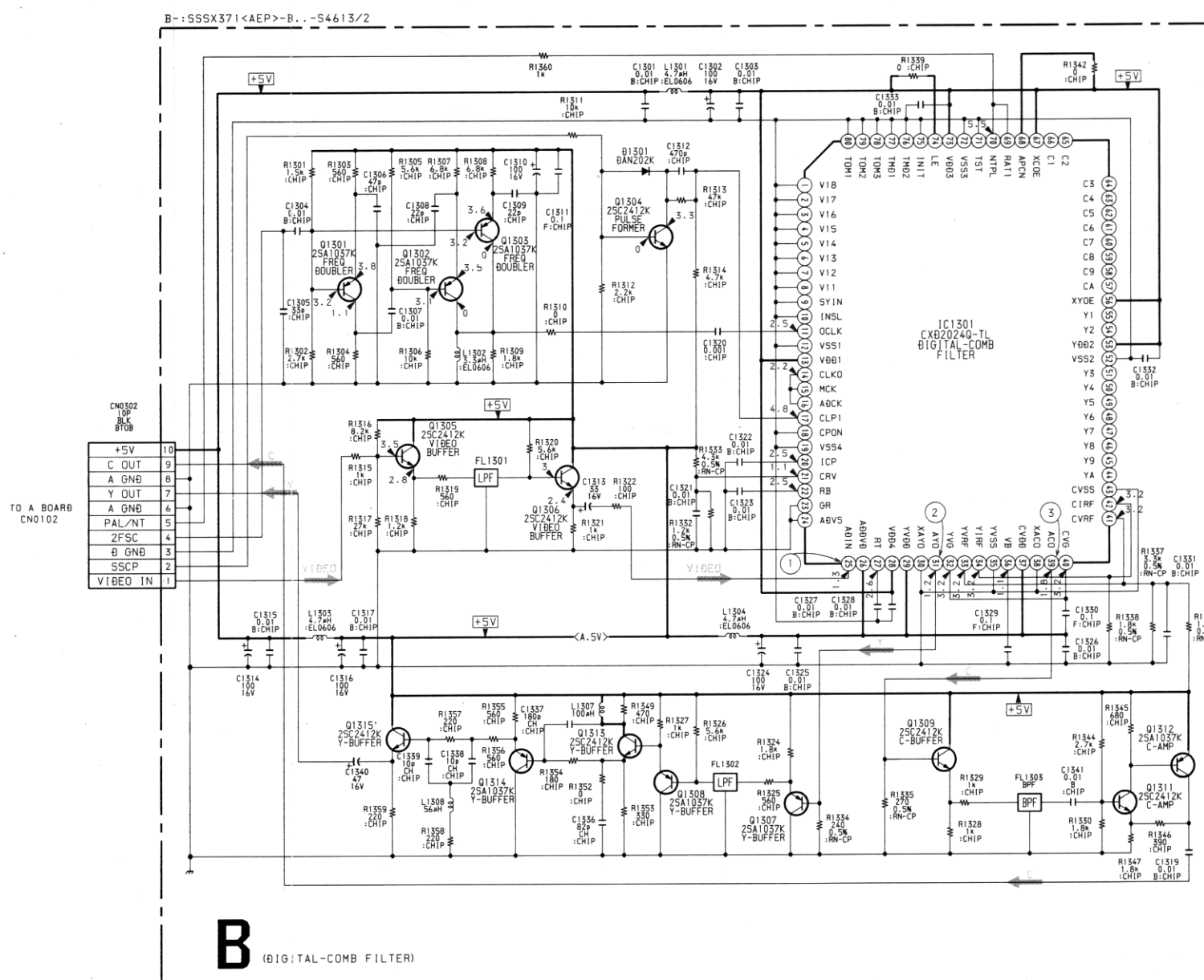
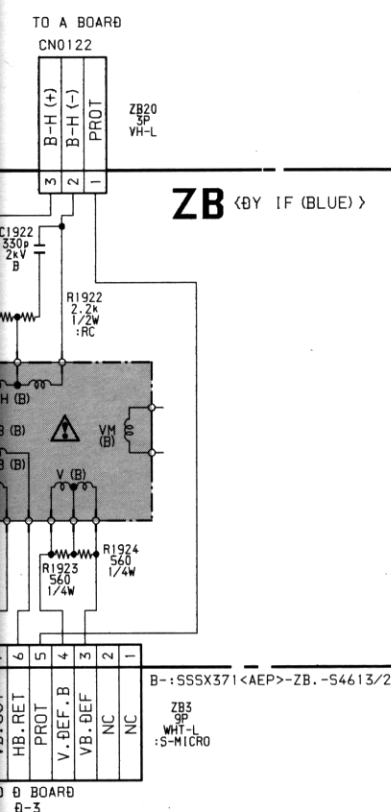


# WAVEFORMS D BOARD











E2

[ SECAM IDENT ]

B

[ DIGITAL-  
COMB FILTER ]

A1

[ NICAM DEMODULATOR  
NICAM DECODER ]

ZR

[ DY IF (RED) ]

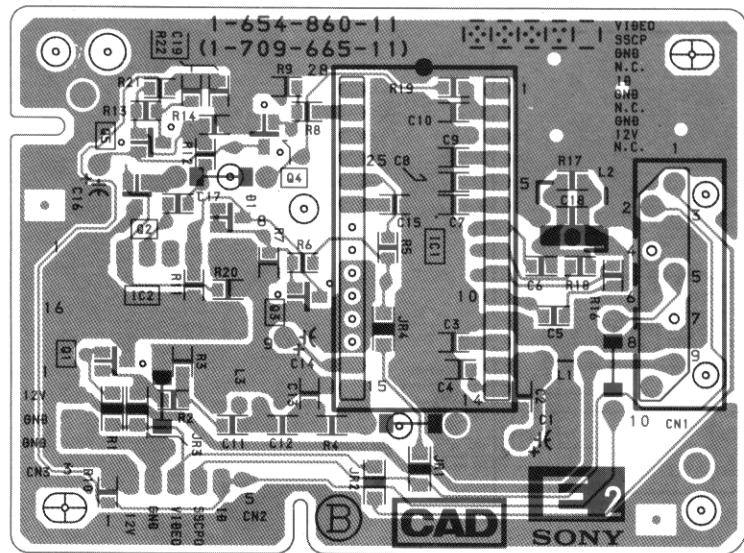
ZG

[ DY IF (GREEN) ]

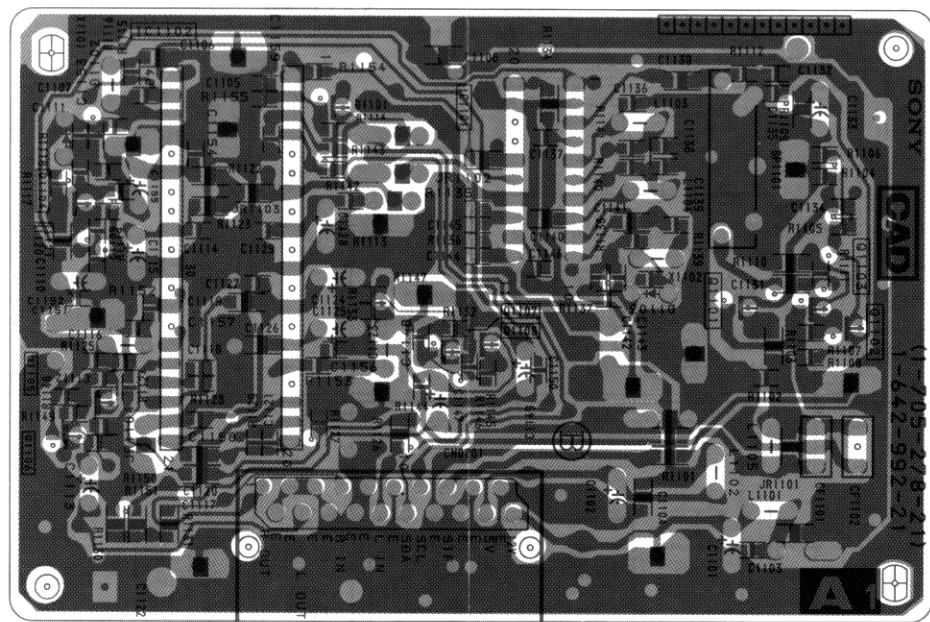
ZB

[ DY IF (BLUE) ]

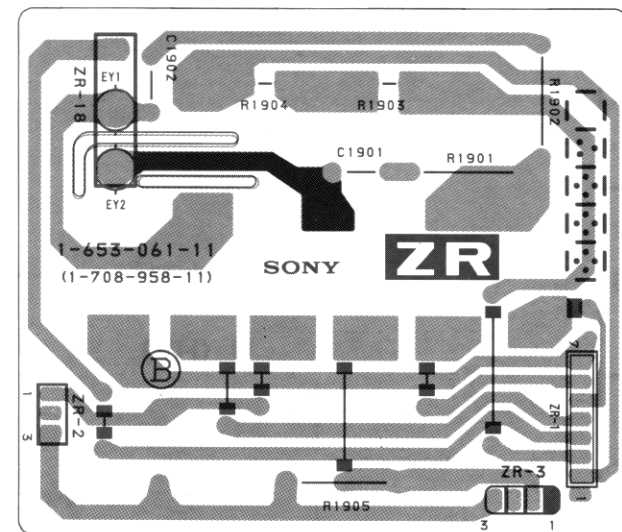
— E2 BOARD —



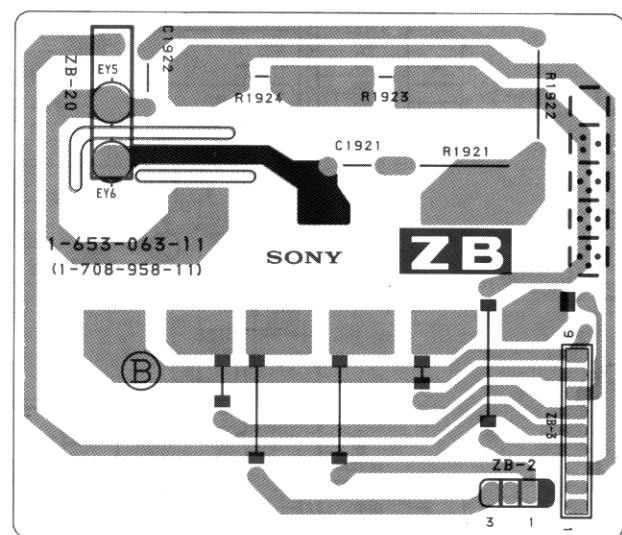
— A1 BOARD —



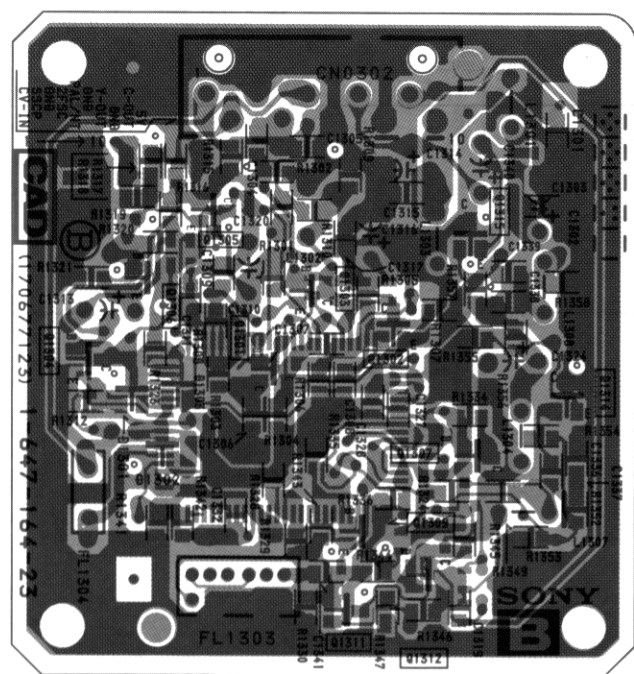
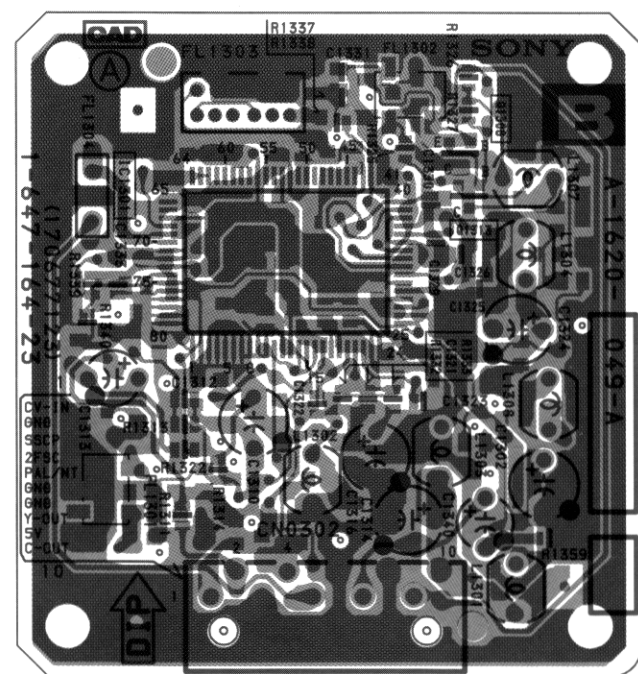
— ZR BOARD —



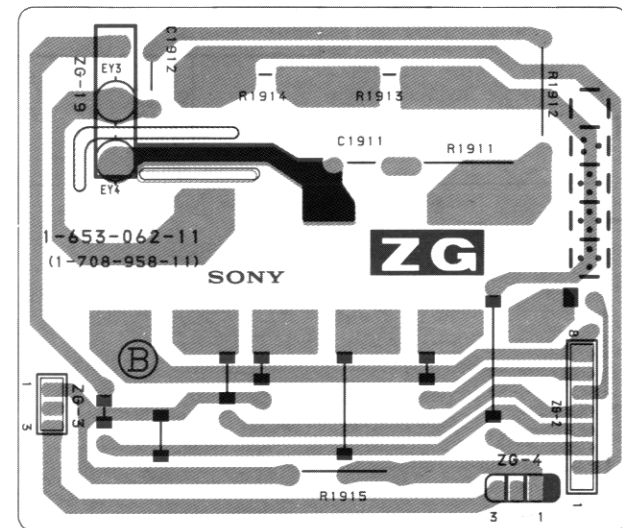
— ZB BOARD —



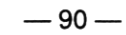
— B BOARD —



— ZG BOARD —

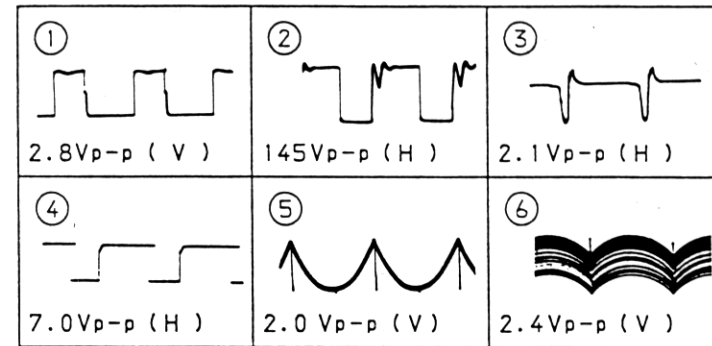


- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

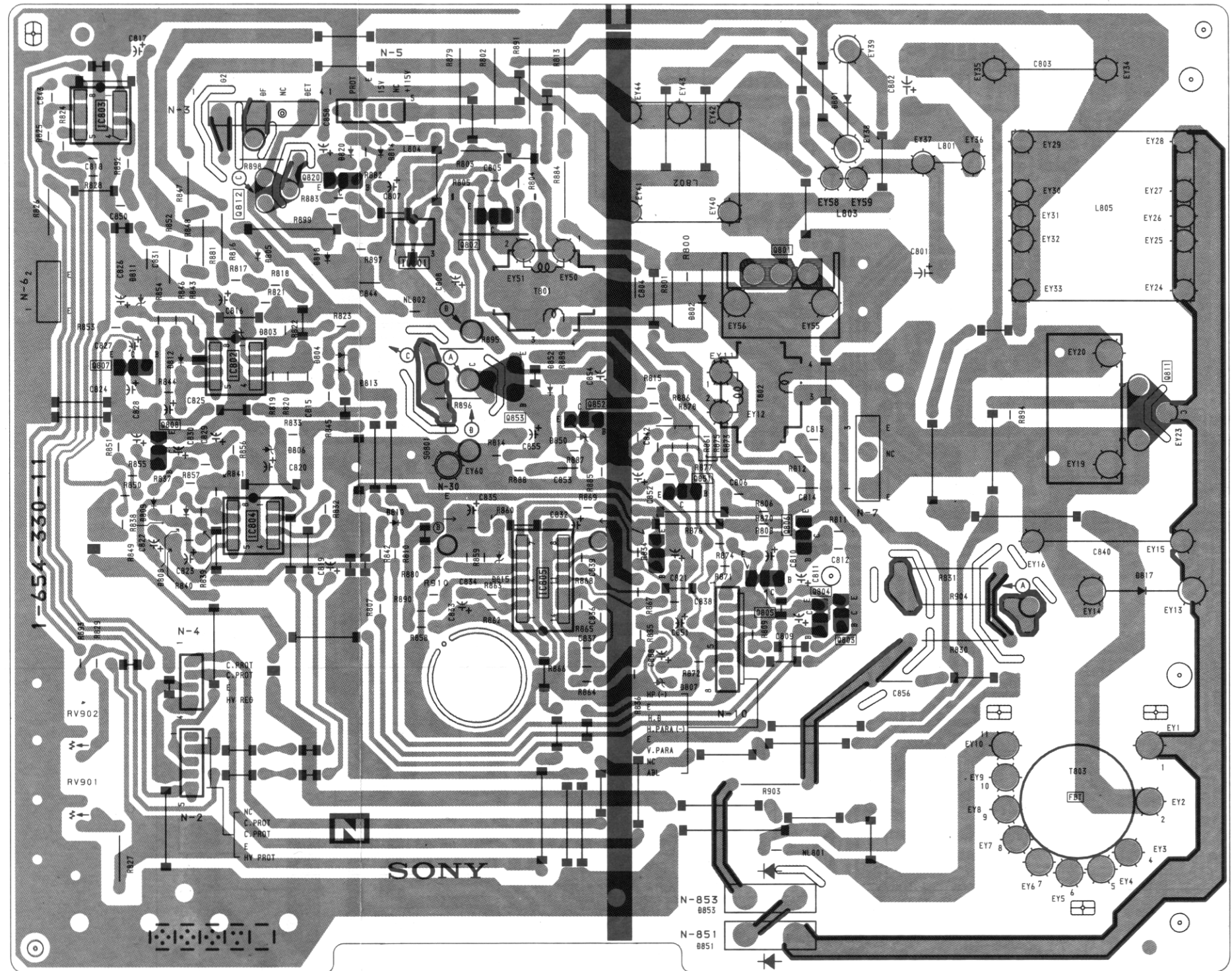




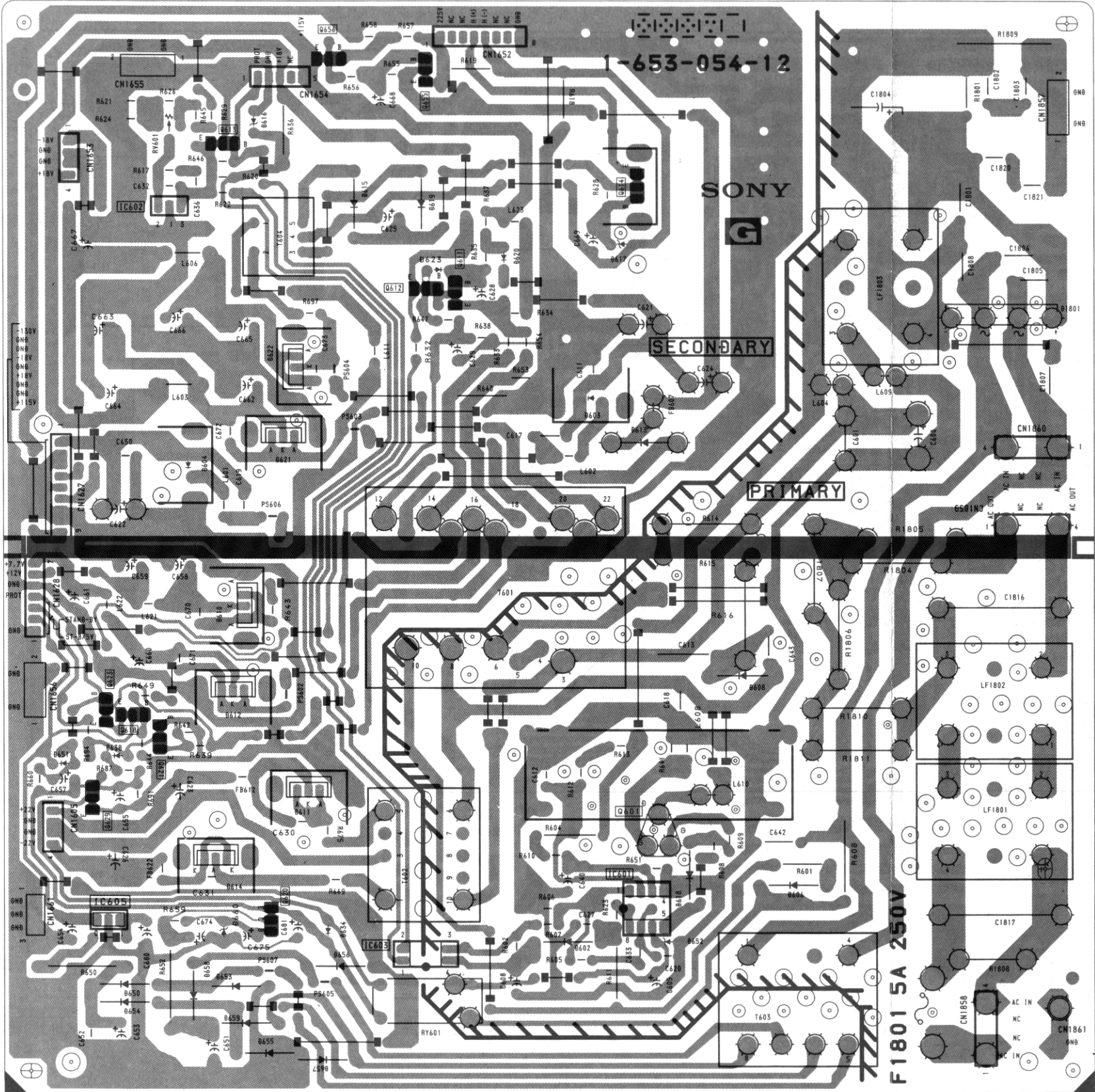
**WAVEFORMS N BOARD**



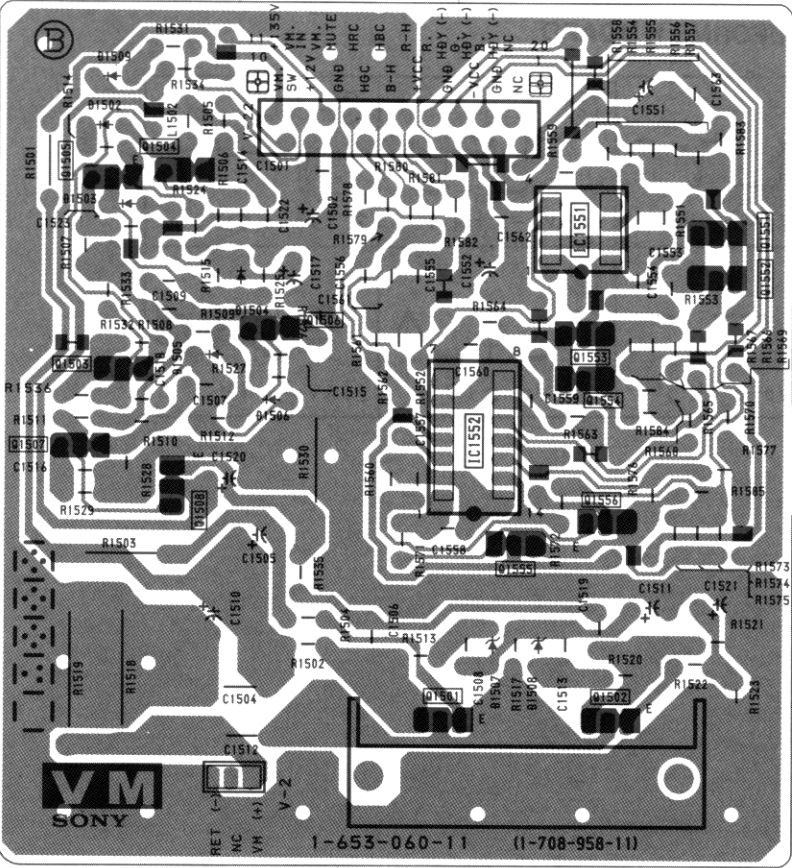
**— N BOARD —**



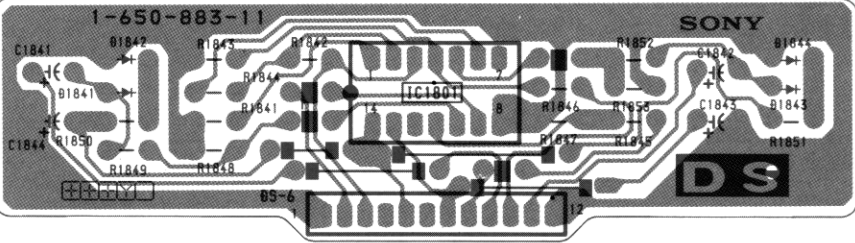
— G BOARD —



— VM BOARD —



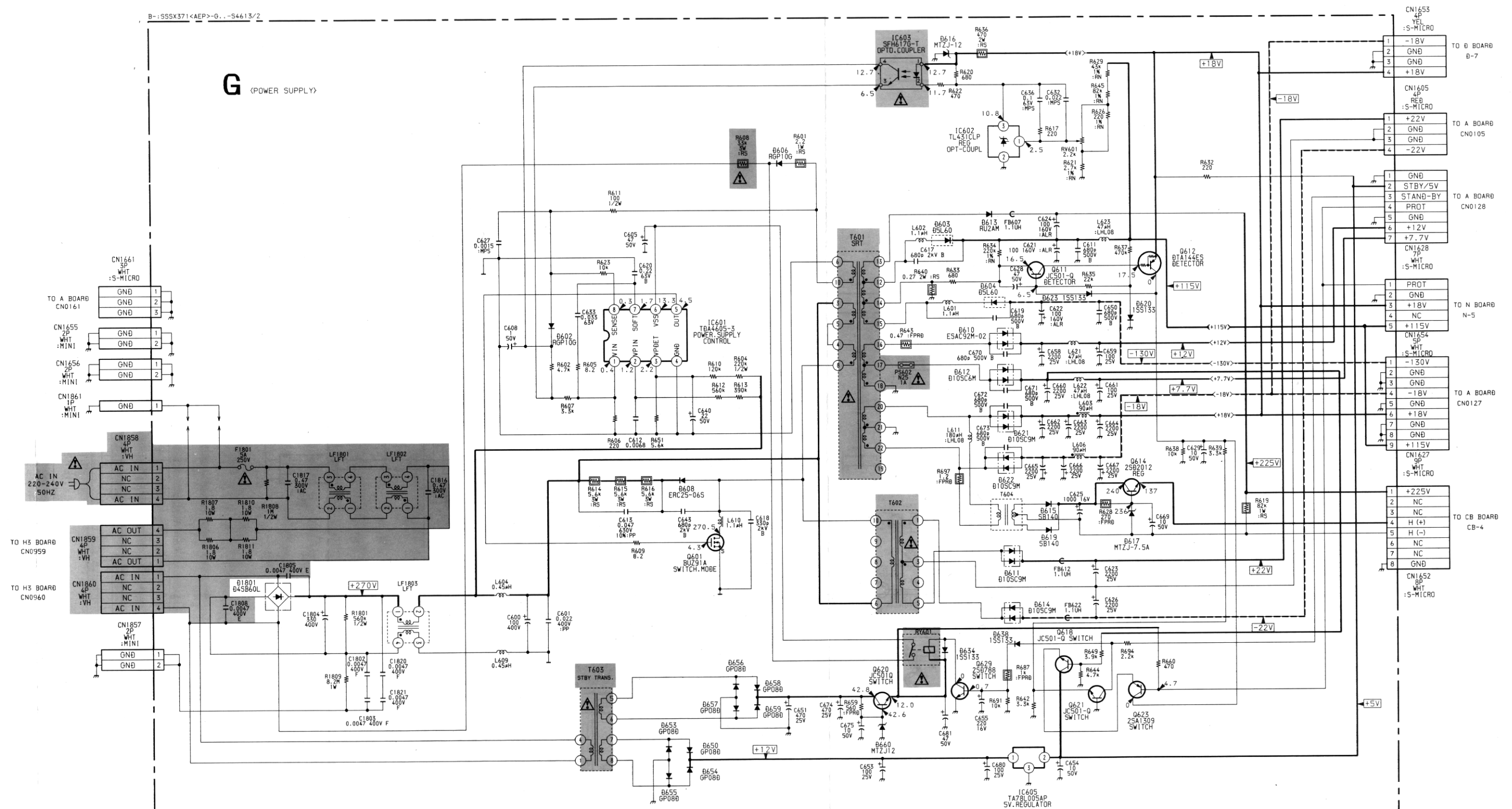
— DS BOARD —





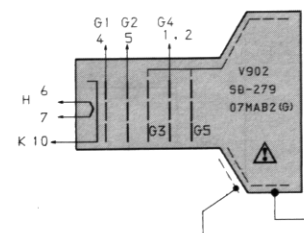
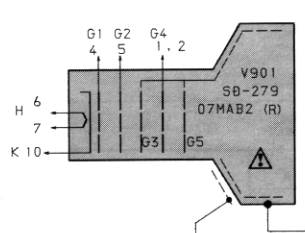
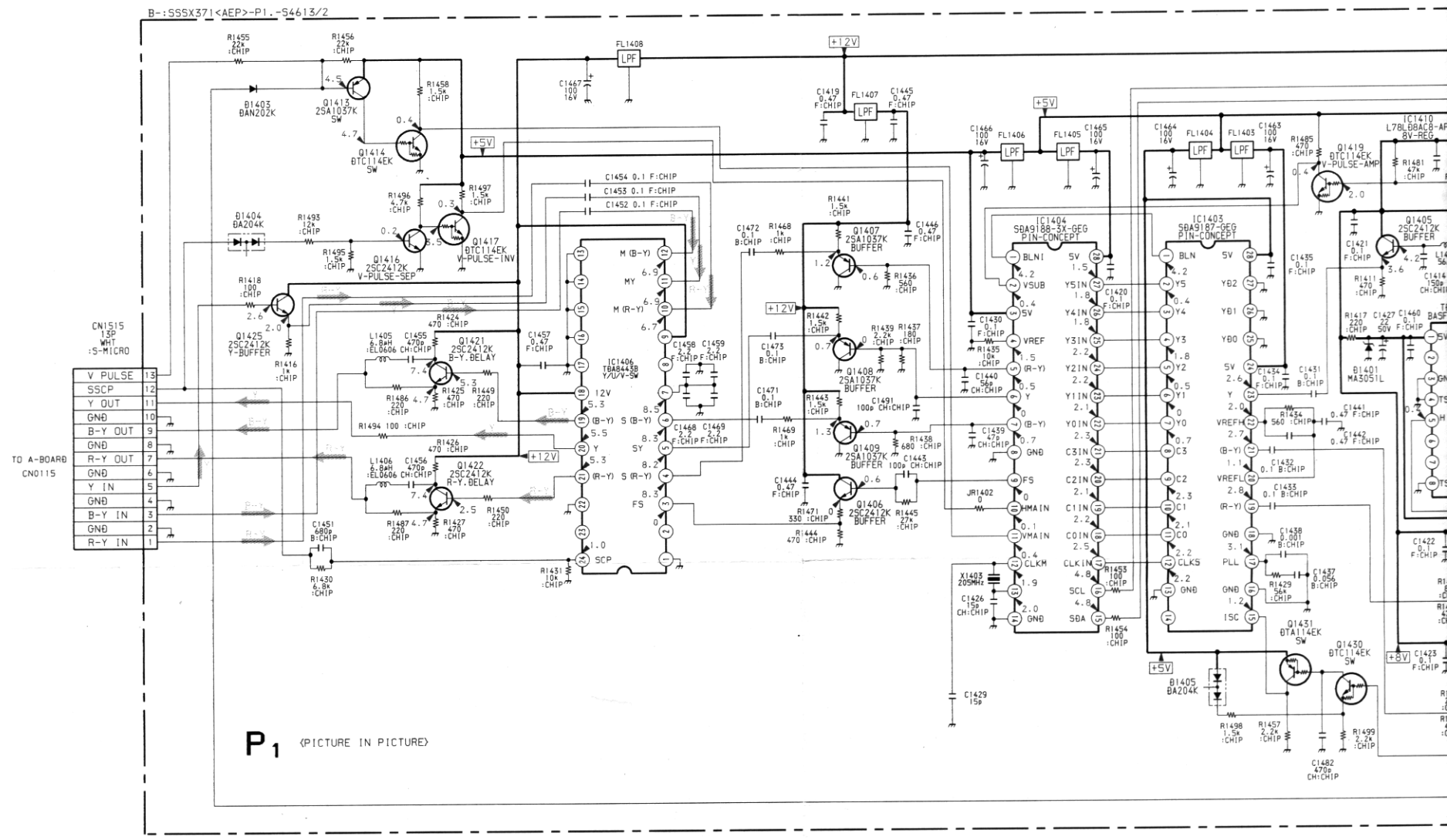


# G (POWER SUPPLY)

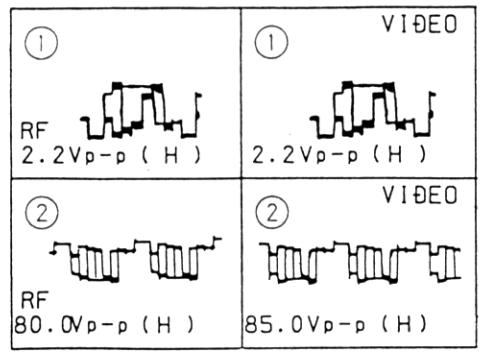




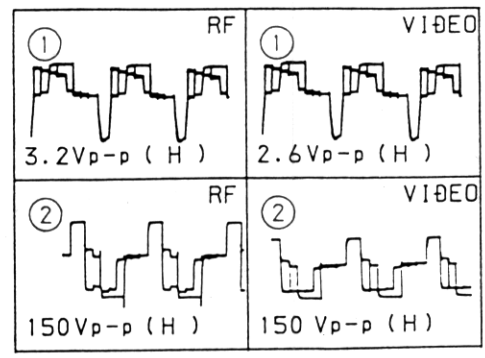
A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P



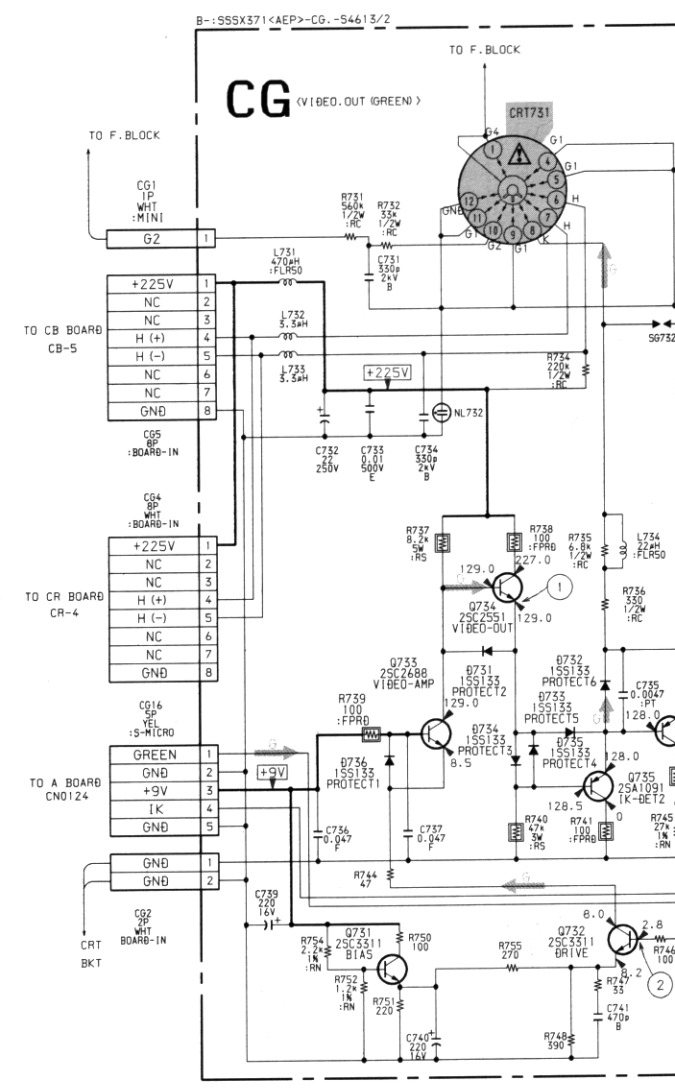
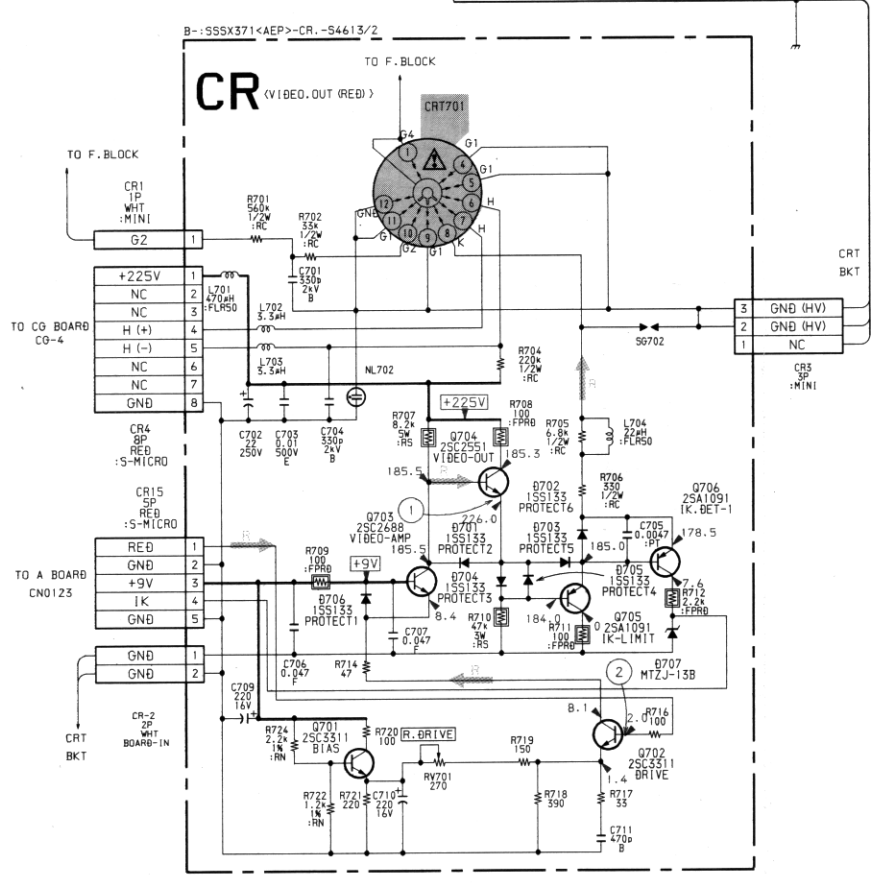
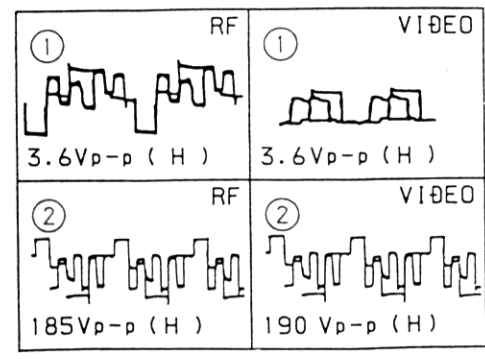
CR BOARD WAVEFORMS

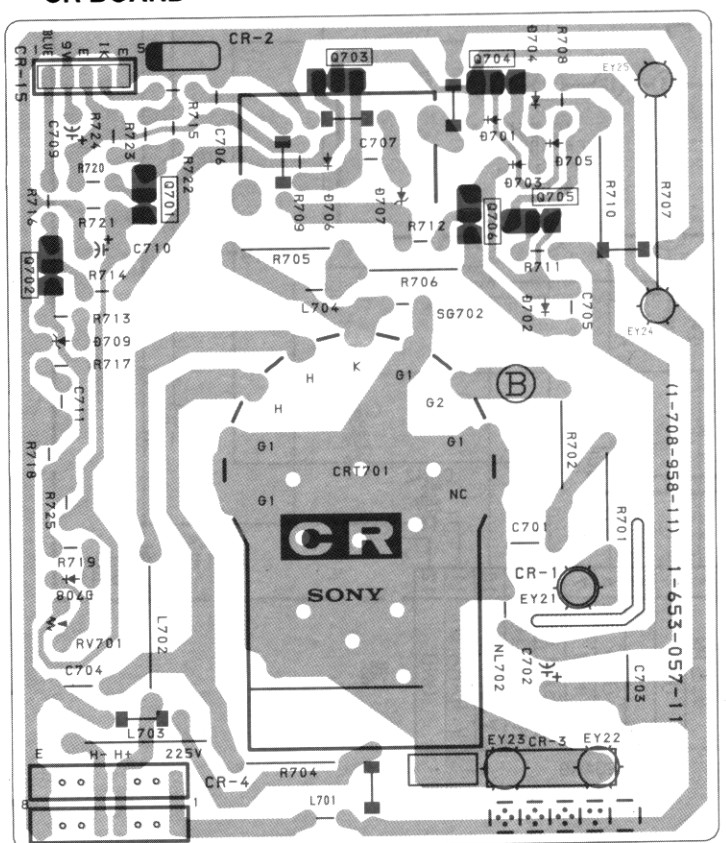
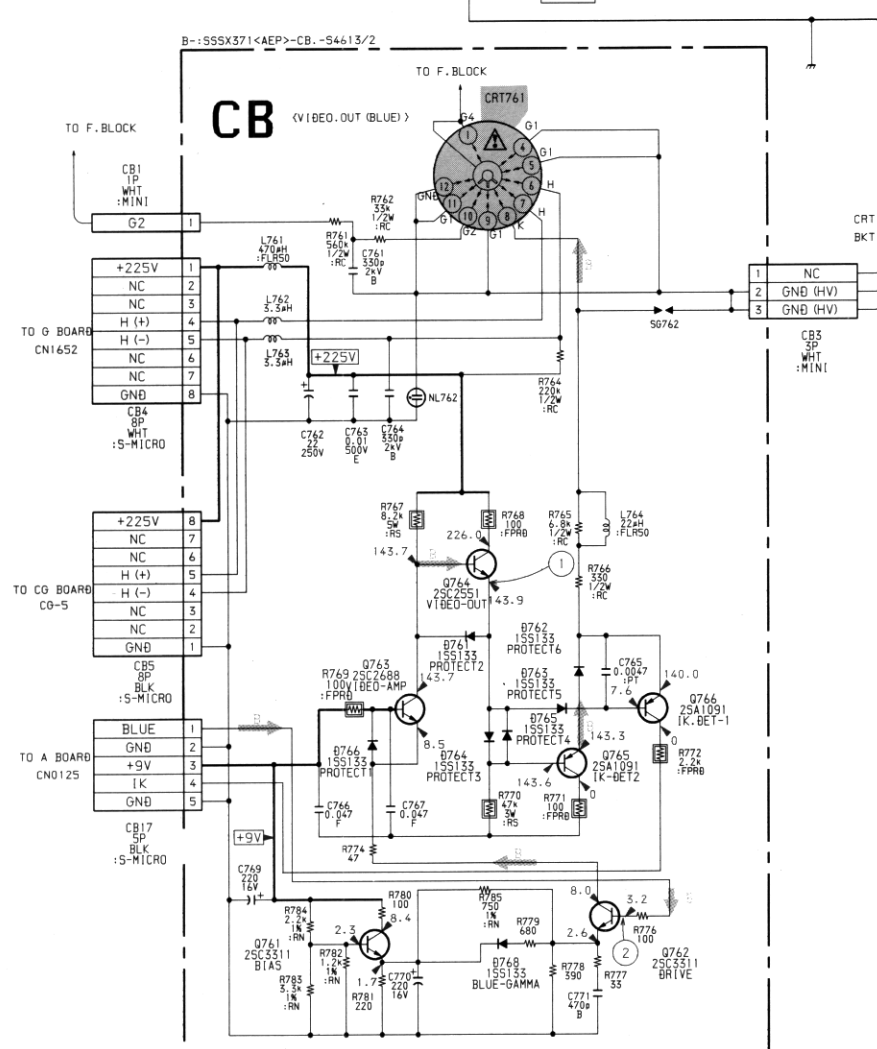


CG BOARD WAVEFORMS



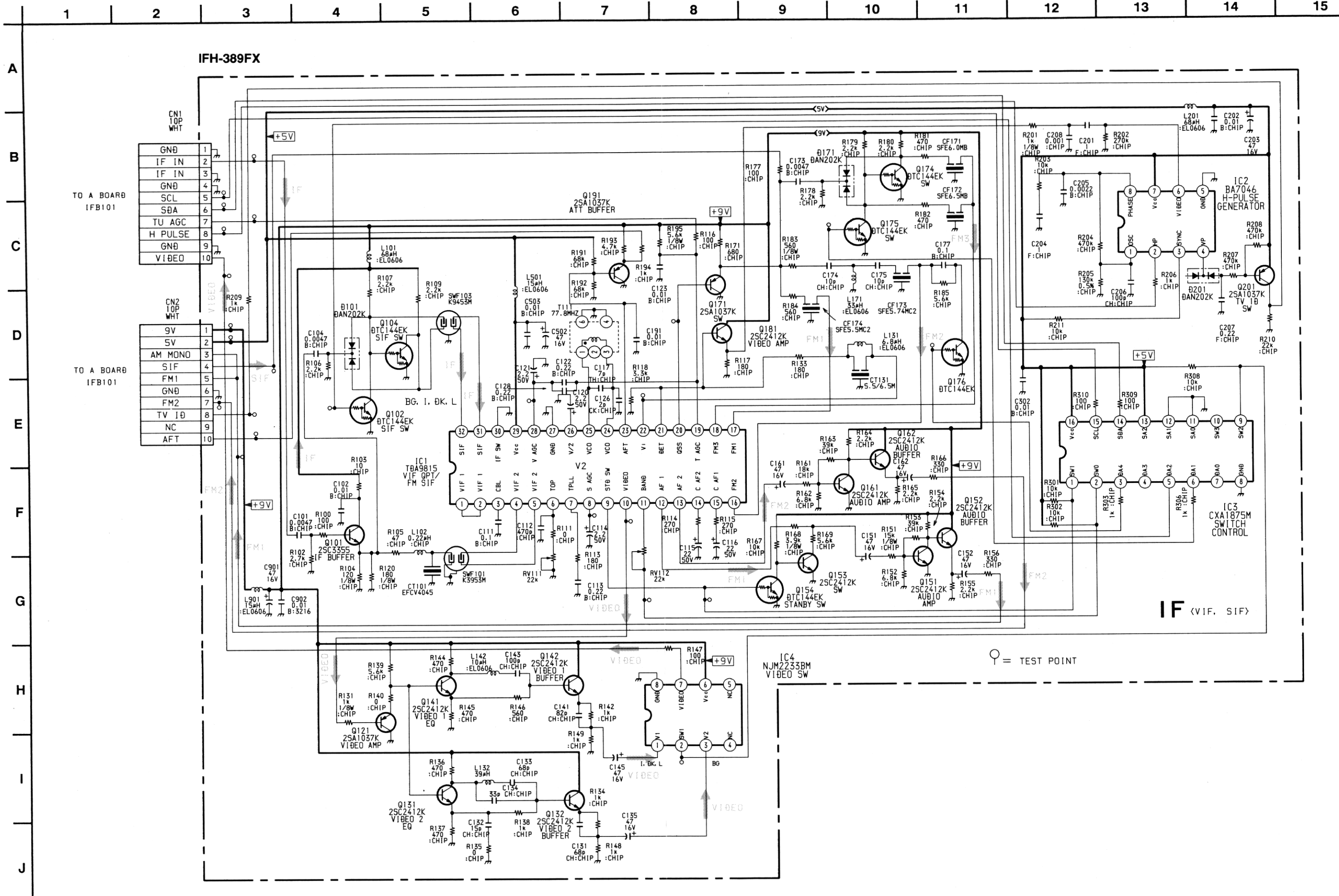
CB BOARD WAVEFORMS



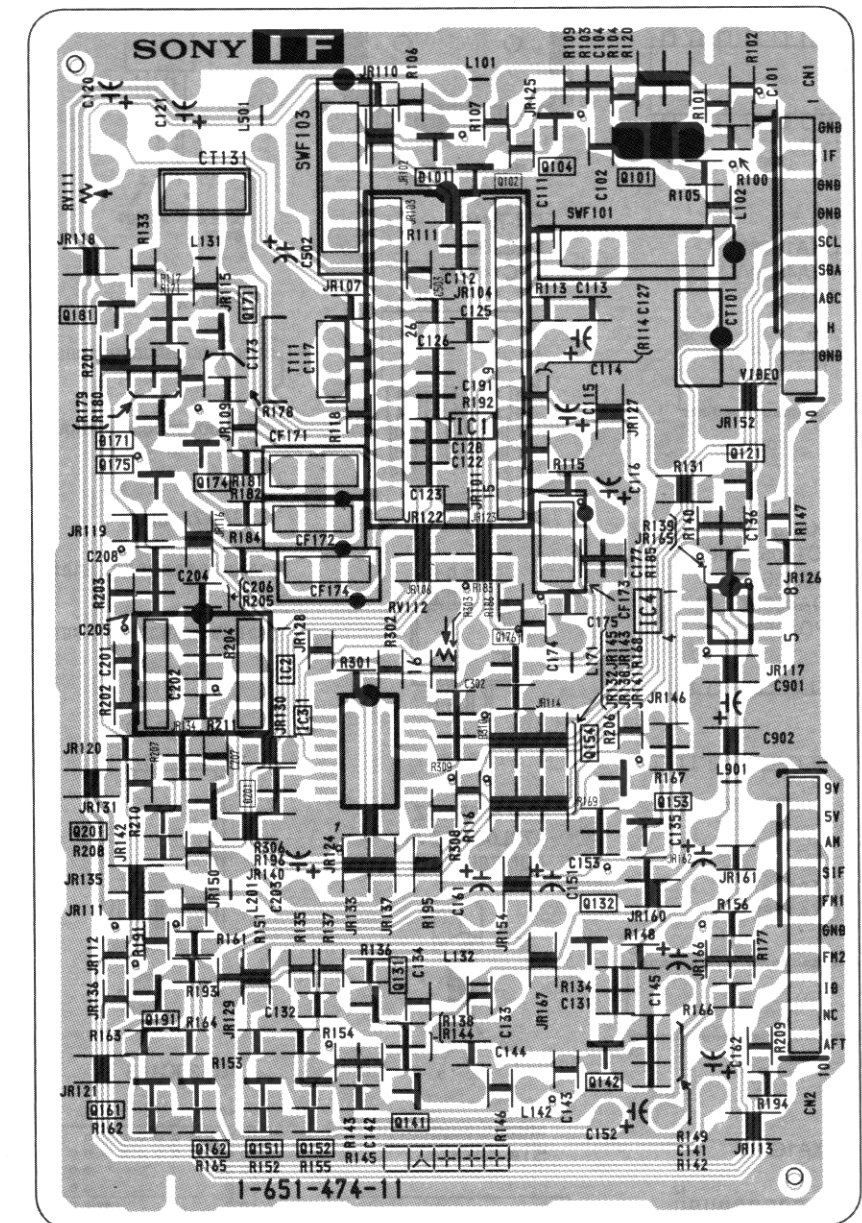
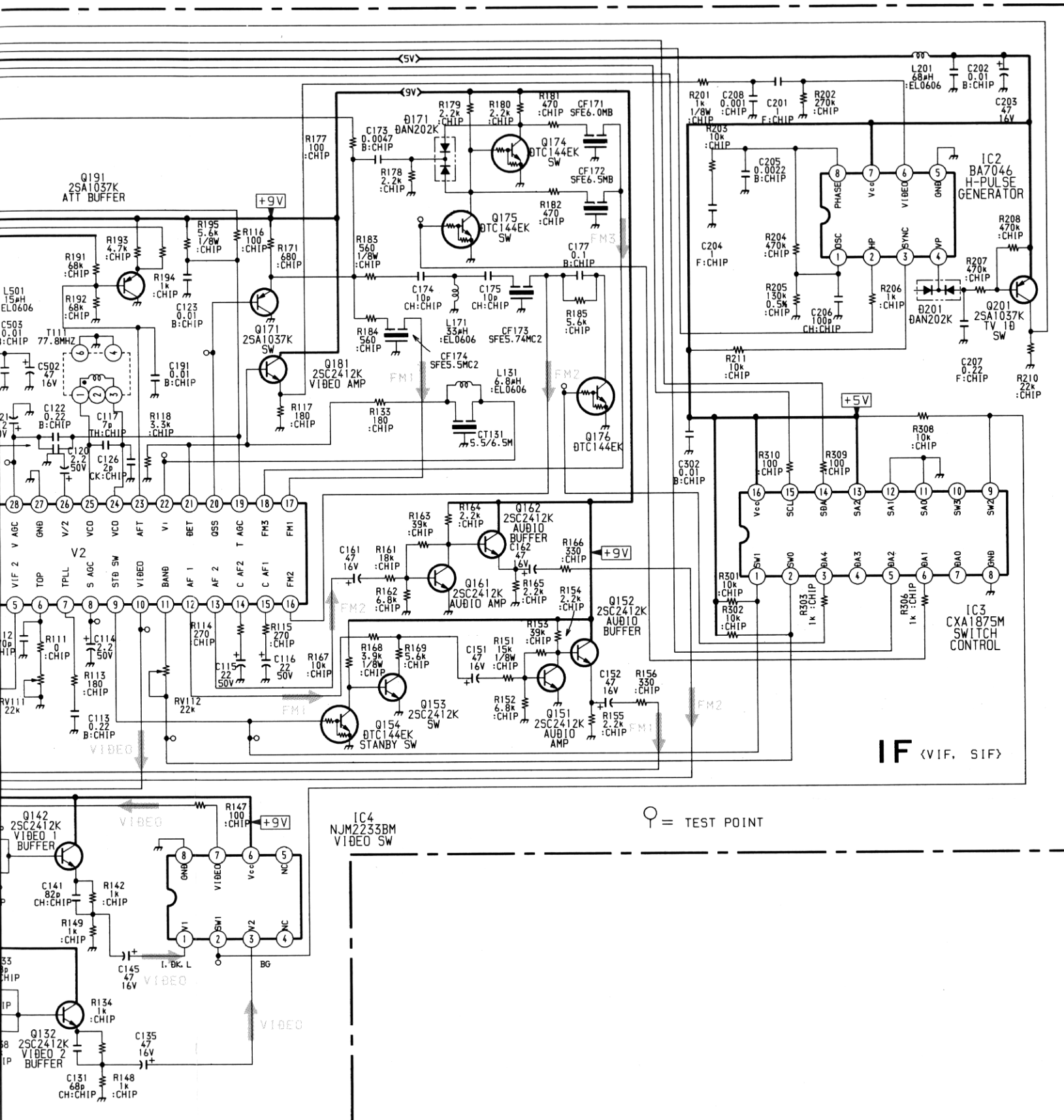






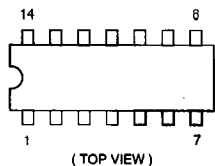


**-IF BOARD-**

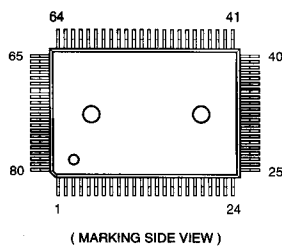


## 5-4. SEMICONDUCTORS

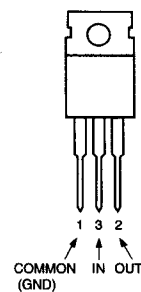
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MB3614  
 $\mu$ PC1394C



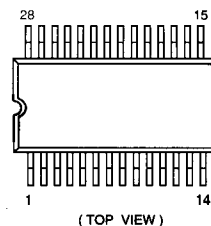
CXD2024Q



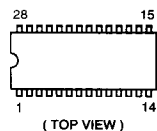
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NJM7915FA



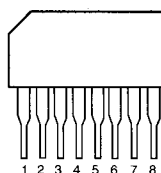
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SDA9188XGEG



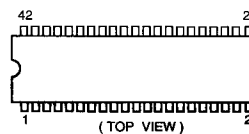
CXA1268P  
TDA4650/V4  
TDA6612



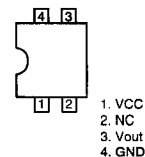
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M5220L  
 $\mu$ PC1498H



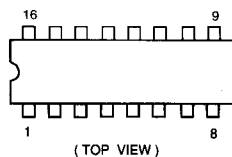
PA0036



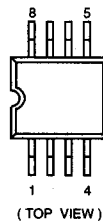
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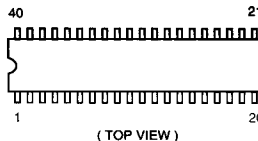
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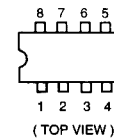
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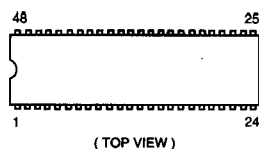
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ST24C16CB1  
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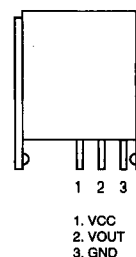
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NJM78L05A



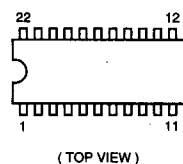
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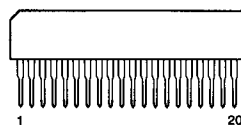
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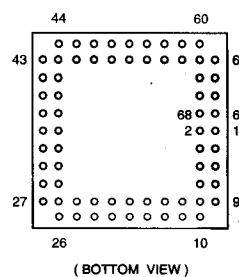
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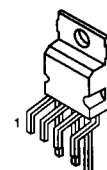
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STK-4278L



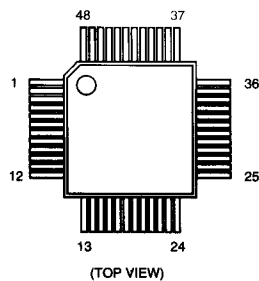
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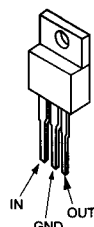
TDA2052



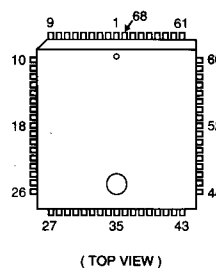
CXD2018Q



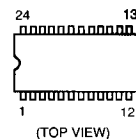
MCT7809CT  
MCT7812CT  
NJM78M05FA  
TA7812S  
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SDA5273P

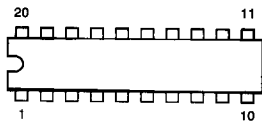


TDA8443B  
TDA9145



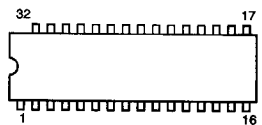


TDA8732



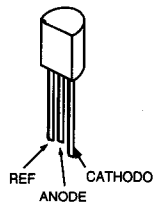
(TOP VIEW)

TDA9160A

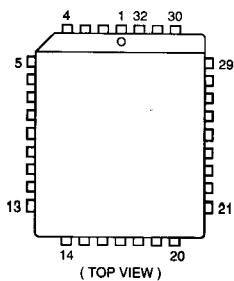


(TOP VIEW)

TL431CLP

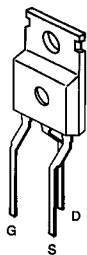


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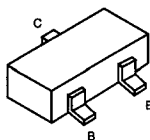
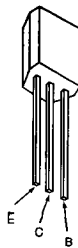


(TOP VIEW)

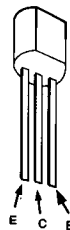
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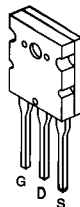
DTA124EK 2SA1037K  
DTA144EK 2SA1162-G  
DTC114EK 2SC2412K  
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DTC144EK 2SC2413K

DTA144ES  
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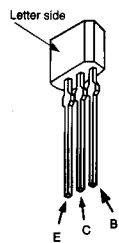
JC501  
2SA1013-O  
2SA1091-O  
2SA1837  
2SC2551-O  
2SD788-5



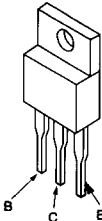
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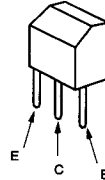
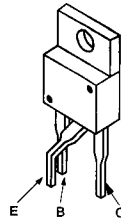
2SA1309A-Q  
2SA1175-HFE  
2SC2785-HFE  
2SC3311A-QRS



2SB1015  
2SB1094-LK  
2SC3675  
2SD1406-YGF

2SB649A-C  
2SC2688-LK

2SC3733

2SC4256CB  
2SC4632-CB7

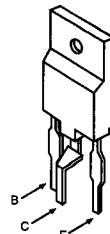
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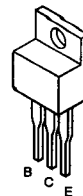
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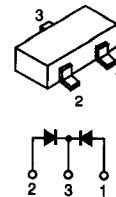
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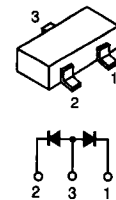
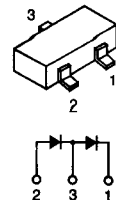
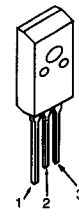
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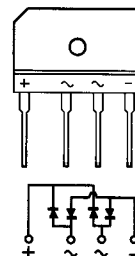
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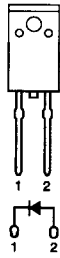
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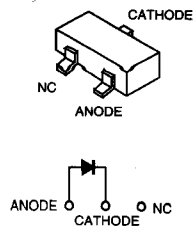
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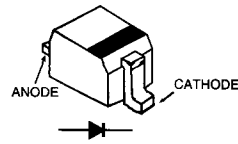
D5L60



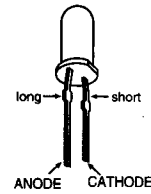
MA3030-H



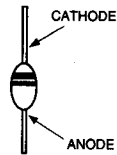
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1SV217



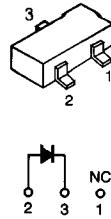
TLR124



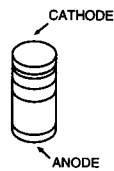
EL1Z  
ERC38-08  
GP08D  
RGP10G  
V06C  
V09G  
V19E  
V30N



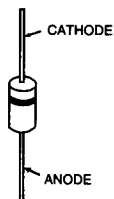
MA3039H  
MA3056



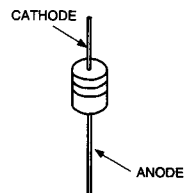
MA3051L



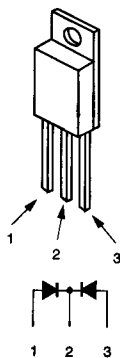
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ERC25-06S  
RU-1C  
RU-2AM  
RU-3AM  
S3V10SB



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MTZJ-5.6B RD2.0ESB1  
MTZJ-7.5A RD5.1ESB2  
MTZJ-9.1 RD5.6ESB2  
MTZJ-12 RD7.5ESB2  
MTZJ-13B RD9.1ESB3  
MTZJ-13C 1SS119  
MTZJ-22 1SS133



ESAC92M-02



SB140

